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ABSTRACT

Traditionally, the most commonly used methods of forecasting school enrollments have been those that looked to the past for a picture of the future. In restricting the forecaster to projections of past trends, the "percentage survival" technique ignores a host of current trends implicit in a changing society. A second problem with most widely used projection methods has been the inadequate expression of the forecaster's certainty or uncertainty. This paper presents the rationale, methods, and documentation for ENSIM, a computer based long-range enrollment simulation. A "multivariable" method of prediction, ENSIM allows the forecaster to consider a broad range of data--both internal (i.e., traditional district information) and external data (i.e., the multitude of social-economic-political-demographic factors that affect the way we live and the way our children learn). Developed and field tested in the small, semirural town of Morgan Hill, California, ENSIM was specifically designed to apply an enrollment projection "simulator" to districts facing extensive future residential development. For this reason, a future land development projection system was devised and integrated into the ENSIM model to provide data on the number of new dwellings projected for each year of the study. This land development projection system is the heart of the ENSIM model. Built into the model is the capability to evaluate and update enrollment projections on a yearly basis. (Author/MLF)

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ENSIM

A User's Manual for a Land Use Analysis-Based Enrollment Simulation

RESEARCH REPORT NUMBER ELEVEN

OF

PROJECT SIMU SCHOOL: SANTA CLARA COUNTY COMPONENT

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FOREWORD

From the beginning, Project Simu School: Santa Clara County Component has been directing research and development activities toward tools which will provide school planners a better understanding of the community in which the educational system functions. Various physical and human characteristics have been studied and made the subject matter of position papers and research reports. Some of these characteristics have been subjected to analysis by computer and others have not yet been adapted to such sophisticated treatment.

One troublesome aspect of community development causes educational planners to question their own predictions for the future. Estimating (guessing?) what effects will accrue from changes in the use of land lying within the district often is based on insufficient information. This paper describes a methodology which can be utilized to study the undeveloped land in a community which is growing--and then to translate the projected new dwelling units into projected new enrollments.

The technique, developed during efforts to prepare a comprehensive plan for the small community of Morgan Hill, California, concentrates on additive factors in an attempt to predict the results of new development. Some data normally deemed important were not available at the time of the Morgan Hill effort. Out-migration of people from the district was not considered pertinent because the great demand for new housing almost insured that vacant dwellings would soon be filled. Ethnic composition of the population was not an important consideration in the predictions since district policies provide for integration of schools through a transportation system covering a huge rural area. Hence, two generally important data elements were ignored in the study and are omitted from the documentation.

Adaptation of ENSIM to a geo-referenced enrollment simulation program which will consider out-migration, ethnic, income and other characteristics of the population has been undertaken since the completion of this first documentation. ENSIM II will be use-tested in school districts in Santa Clara County early in 1974. This sophisticated version will incorporate interactive analysis of attendance areas utilizing address-coded enrollment predictions and will take into account mobility of the population and other changes in the use of land.

Districts with problems not addressed by this model will seek other enrollment predictors--but the analysis of the use of land as described will be a necessary step in any comprehensive planning effort. It is presented in the hope that planners will find it helpful.

Lester W. Hunt, Director
Project Simu School: Santa Clara County Component

The project presented or reported herein was performed pursuant to a grant from the U.S. Office of Education, Department of Health, Education and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred.

I. INTRODUCTION

Traditionally, the most commonly used methods of forecasting school enrollments have been those that looked to the past for a picture of the future. The "Cohort Survival" technique is, for example, a projection method which relies solely on past enrollment figures for estimating future enrollment. In restricting the forecaster to projections of past trends, the "percentage survival" technique ignores a host of current trends implicit in a changing society.

A second problem with most widely used projection methods has been the inadequate expression of the forecaster's certainty or uncertainty. Single estimate projections are too often accepted as fact by the user; and with multiple estimates, the user often tends to choose an intermediate figure rather than a high or low.

These and other problems have led to imprecise and unrefined prediction techniques, which have in turn led to empty classrooms and, in some cases, even empty schools.

This paper presents the rationale, methods and documentation for ENSIM, a computer based long-range enrollment simulation. A "multi variable" method of prediction, ENSIM allows the forecaster to consider a broad range of data--both internal (i.e., traditional district information) and external data (i.e., the multitude of social-economic-political-demographic factors that affect the way we live and the way our children learn). In short, ENSIM looks to both the past and the present--the school and the community--in projecting the extent and location of enrollment growth.

Developed and field tested in the small, semi-rural town of Morgan Hill, California, ENSIM was specifically designed to apply an enrollment projection "simulator" to districts facing extensive future residential development. For this reason, a future land development projection system was devised and integrated into the ENSIM Model to provide data on the number of new dwellings projected for each year of the study. This land development projection system is the heart of the ENSIM Model.

After a number of predictive computer programs were considered, a program developed by Dr. Carolyn Denham at California State University, Long Beach (1970) was chosen as the basic computational procedure for the enrollment projection portion of the ENSIM Model. The Denham program requires that the forecaster provide probabilistic input, i.e., most likely and high and low values for the estimated input variables. (The forecaster is free to select his own method for making these estimates.)

The reader will note that the enrollment simulation model does not consider possible out-migration. It is not considered because, as stated, ENSIM was designed for application in districts facing extensive growth. The expected magnitude of this growth would, in most cases, dwarf any out-migration of population. ENSIM II, described briefly in the foreword of this document, will take into account the out-migration factor as well as a number of other decreasing enrollment factors not germane to this document.

II. ENROLLMENT SIMULATION MODEL - A Summary of Input and Procedure

Figure 1 provides a flow chart of the ENSIM Model. Oval symbols represent the primary input data; the circles represent the computer programs; the octogon represents secondary input data, required only for calculating total child-bearing females and obtained from land use data; the squares represent output which subsequently become input; and the rectangle represents the final output of the model, the predicted enrollment by grade by year:

1. ⬭ = primary input data
2. ○ = computer programs
3. ⯃ = secondary input data used only in calculating total child-bearing females
4. □ = output which subsequently becomes input
5. ▭ = final output of model

The six computer programs that comprise the ENSIM Model require four types of input variables. These primary input types are:

1. School district enrollment data, such as transfers to non-public schools, dropouts, etc.

2. Health department data, such as number of births each year, fertility rate, etc.

3. Land use data, such as area development policies, number of potential acres to be developed, etc.

4. School district census data, such as total number of females living in the district, average number of children per dwelling type, etc.

Groups 1 and 2, school district enrollment data and health department data, are input directly into Program #6, the Denham Model. Groups 3 and 4, however, go through a series of five steps, each step comprised of a computer program, before they emerge as the net migration data needed for input into the Denham simulation program.

A summary of the six steps comprising the ENSIM Model follows.

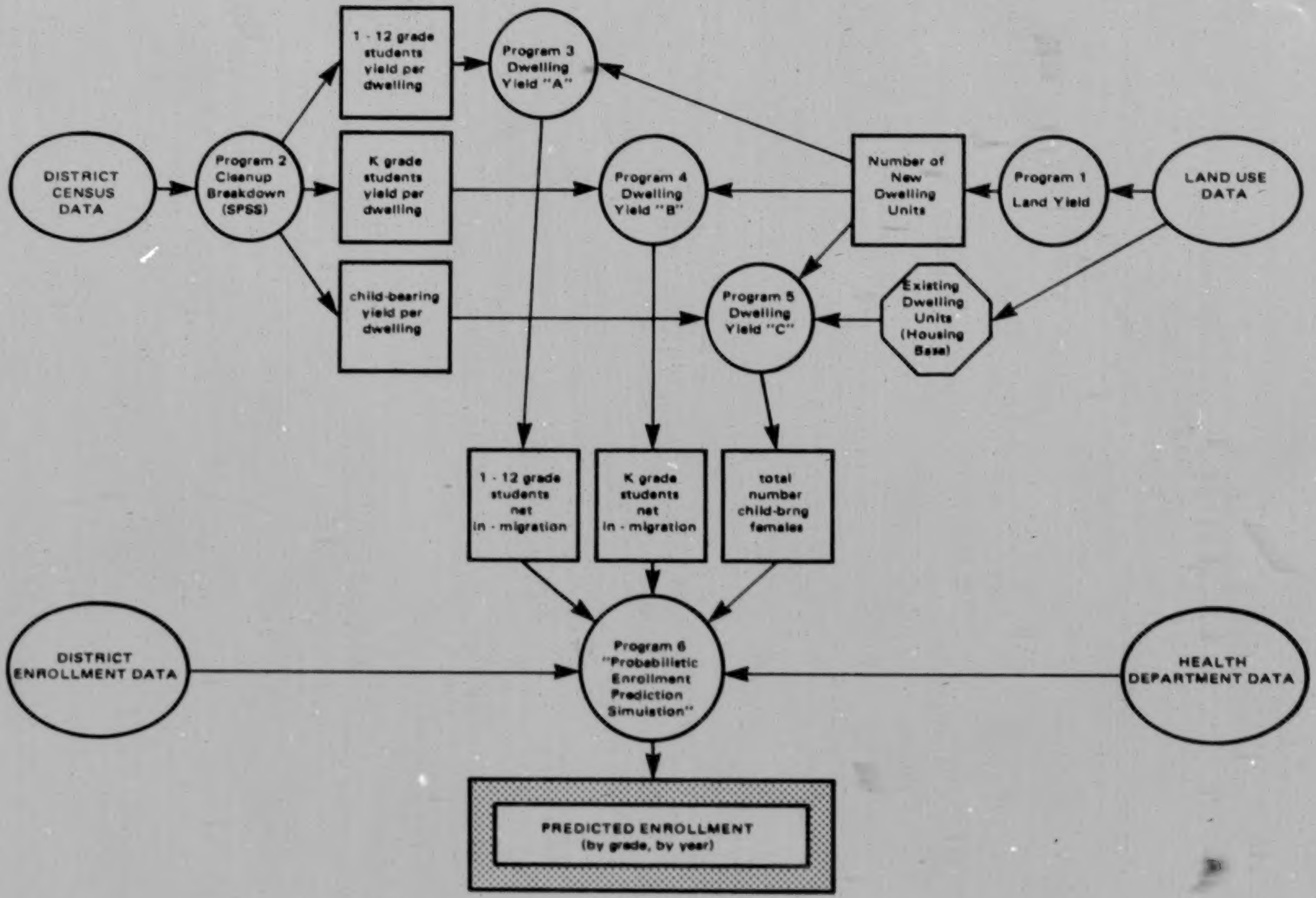
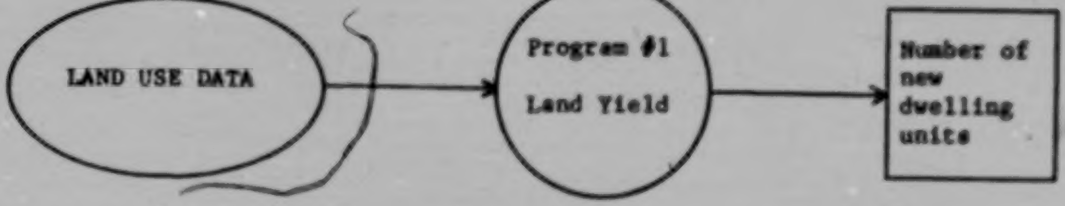
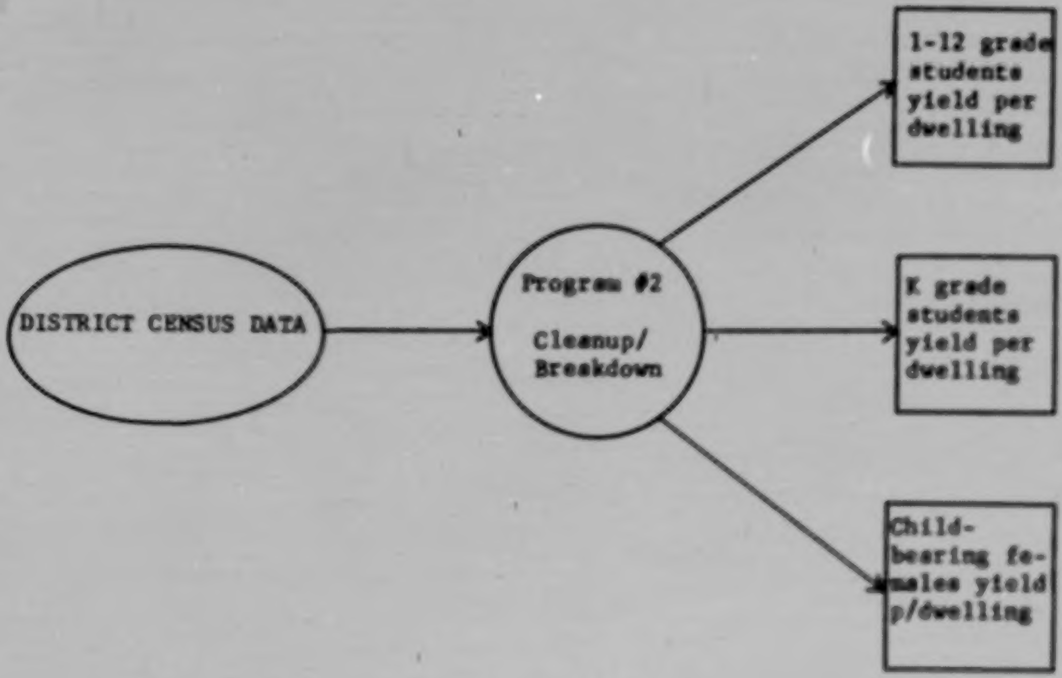

DISTRICT CENSUS DATA
Program 2 Cleanup Breakdown (SPSS)
1 - 12 grade students yield per dwelling
K grade students yield per dwelling
child-bearing yield per dwelling
Program 3 Dwelling Yield "A"
Program 4 Dwelling Yield "B"
Program 5 Dwelling Yield "C"
Number of New Dwelling Units
Program 1 Land Yield
LAND USE DATA
Existing Dwelling Units (Housing Base)
1 - 12 grade students net in - migration
K grade students net in - migration
total number child-brng females
DISTRICT ENROLLMENT DATA
Program 6 "Probabilistic Enrollment Prediction Simulation"
HEALTH DEPARTMENT DATA
PREDICTED ENROLLMENT (by grade, by year)

Figure 1

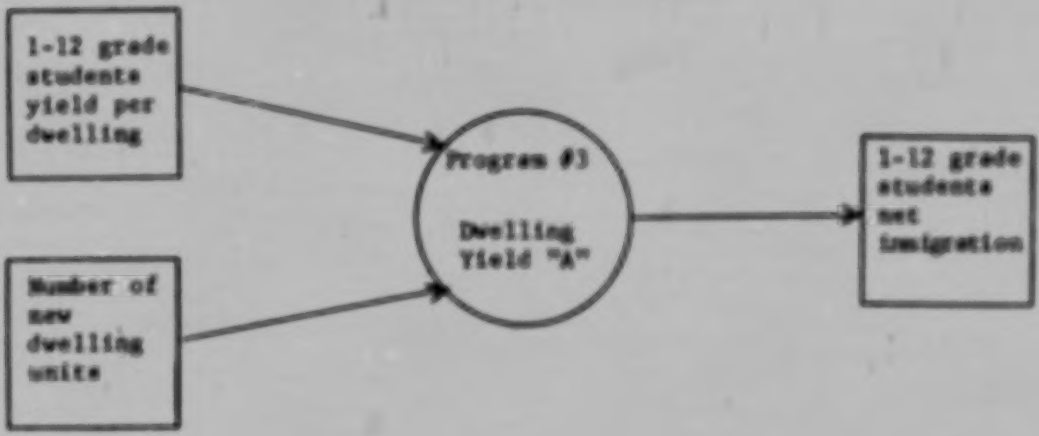
Step One: Land use data, such as total acres available for development, housing trends and existing densities, are input into computer program #1, Land Yield, to determine the number of dwelling units by five year period, by type, by study area that will be constructed in the future.


LAND USE DATA
Program #1
Land Yield
Number of new dwelling units

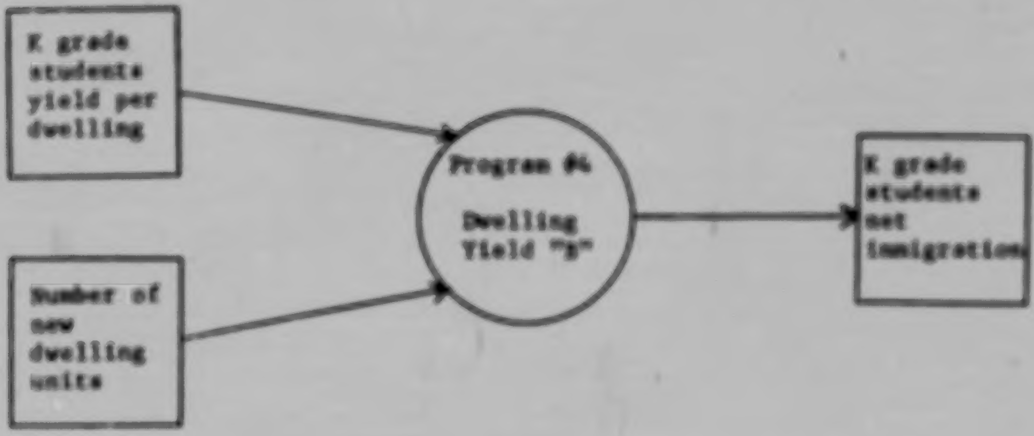
Step Two: School district census data are input into computer program #2, Cleanup and Breakdown, to determine the dwelling yield per dwelling tyep of 1-12 grade students, K grade students and child-bearing females.


DISTRICT CENSUS DATA
Program #2
Cleanup/
Breakdown
1-12 grade students yield per dwelling
K grade students yield per dwelling
Child-bearing females yield p/dwelling

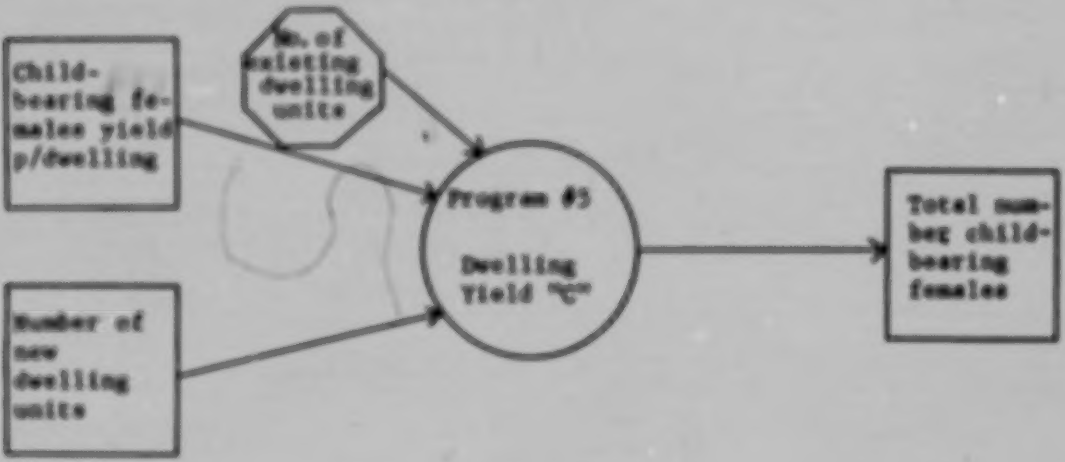
Step Three: Number of dwelling units to be constructed in the future (output of Step One) and grade 1-12 student yield per dwelling (output of Step Two) are interfaced in computer program #3, Dwelling Yield "A", to determine net immigration of grades 1-12 into the district.


1-12 grade students yield per dwelling
Number of new dwelling units
Program #3
Dwelling Yield "A"
1-12 grade students net immigration

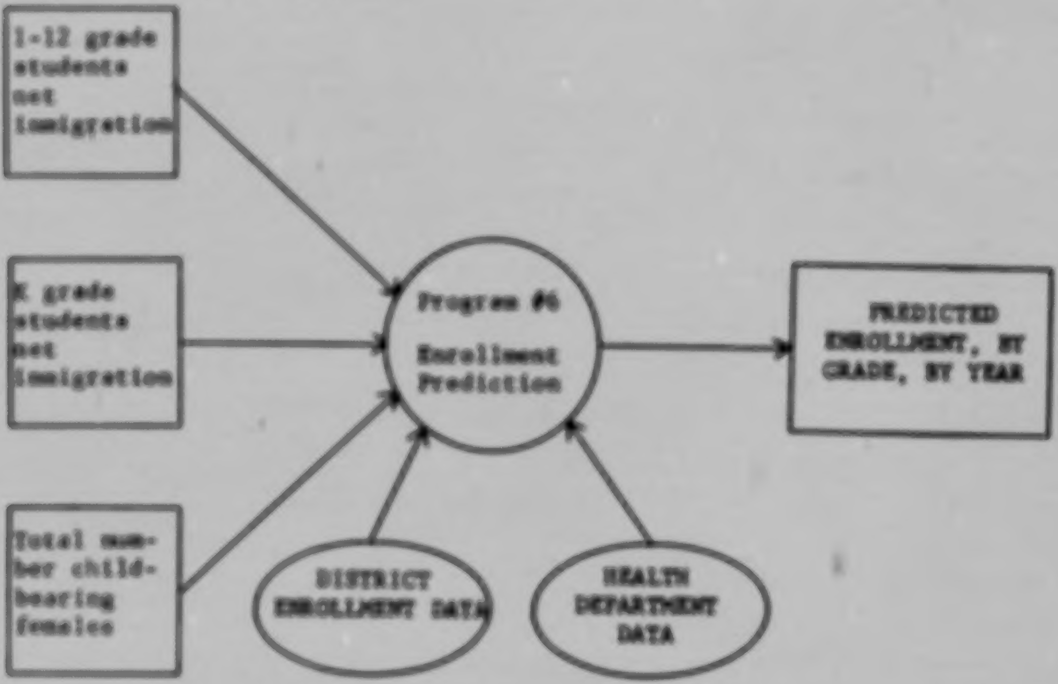
Step Four: Number of dwelling units to be constructed in the future (output of Step One) and grade K student yield per dwelling (output of Step Two) are interfaced in computer program #4, Dwelling Yield "B", to determine net immigration of K grade into the district.


K grade students yield per dwelling
Number of new dwelling units
Program #4
Dwelling Yield "B"
K grade students net immigration

Step Five: Number of dwelling units to be constructed in the future (output of Step One), number of existing dwelling units, and female yield per dwelling (output of Step Two) are interfaced in computer program #5, Dwelling Yield "C", to determine total number of child-bearing females in the district.

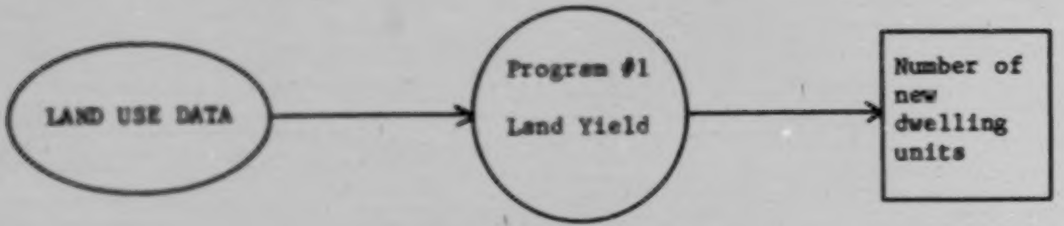

Child-bearing females yield p/dwelling
No. of existing dwelling units
Number of new dwelling units
Program #5
Dwelling Yield "C"
Total number child-bearing females

Step Six: Outputs of Steps Three, Four and Five and primary inputs (school district enrollment and health department data) are input into computer program #6, the Denham Enrollment Program, to determine enrollment by year, by grade.


1-12 grade students net immigration
K grade students net immigration
Total number child-bearing females
Program #6
Enrollment Prediction
DISTRICT ENROLLMENT DATA
HEALTH DEPARTMENT DATA
PREDICTED ENROLLMENT, BY GRADE, BY YEAR

III. THE SIX STEPS OF ENSIM

Step One - Dwelling Unit Prediction



The long-range prediction of dwelling unit construction is a key step in applying the Denham Model to developing enrollment areas. The immigration of students, the total number of child bearing females, and eventually, the new births, are calculated on the basis of the predicted number of new dwellings to be constructed each year.

A more detailed description of the process is found in "A Case Study--Morgan Hill Unified School District" (Appendix A). While much of the case study pertains to information unique to Morgan Hill Unified School District, it is felt that a description of an actual application of the model will be helpful to the reader. For this reason, most of the eleven steps conclude with a reference to an appropriate section of the case study. (Note: In explanations of steps 2-6 of the ENSIM Model, references to the Morgan Hill study appear in the text itself rather than in the appendix.)

Step A - Land Use Committee

A land use committee made up of knowledgeable district residents, must be established. The committee must represent a broad cross-section of the community--people who have lived in the district, seen it grow, know, in a non-technical sense, its potential. If the land use portion of the ENSIM Model is to provide realistic data about the district's future growth, technical personnel must be aided by the district's citizenry. (See appendix. Also see Community Profile, a Project Simu School publication.)

Step B - Growth Rates, Trends and Development Potential

A broad data gathering effort must be undertaken by both staff and land use committee members. Special characteristics of the district, as well as growth history and current building activity, must be analyzed and interpreted. A sampling of some of the questions that must be answered follows:

--What are the governmental agencies or "spheres of influence" that control the district's growth?

--Where are the population centers and why are they where they are?

--What land features have had historic influence on the development of the district?

--What transportation routes have significantly influenced growth? Will they continue to influence growth?"

--What industries have been responsible for growth in the district? Will new industries slated to enter the district have an impact on district growth?

--Where is current development activity centered? Why there?

--Have major subdivisions been proposed in otherwise undeveloped areas?

--Do any of the governmental agencies within the district have General Plans?

--What zoning and General Plan changes are in the offing?

--What new amenities and essential services are being planned for the future?

--What external forces, outside of the district, such as state and federal governments, may affect development in the district?

These are, of course, just a few of the factors that must be considered. Every school district will have its own history and special characteristics and its own unique set of questions to be answered.

Once this data is collected, it must be entered on a large-scale map of the district. From these data and data generated from later steps of the land analysis procedure, trends in development will begin to emerge. (See appendix.)

Step C - Critical Development Factors

From the vast array of data collected in Step B, several critical development factors, deemed by staff and committee to be pivotal in the district's type and rate of growth, must be identified. Many of these factors will be localized in their impact and will not affect the entire district. A sampling of possible critical development factors follows:

--Sewerage lines extension

--Annexation of county territory into city jurisdiction

--Improved water supply

--New transportation routes

--New industry

--Increased or decreased lot size regulations

--Major proposed subdivisions

Step D - Study Areas

In order to analyze and project future development, it is necessary to divide the district into smaller, more manageable units. Study areas should be homogenous in regard to their development potential (i.e., the important factors that will influence their type and rate of growth). Thus, changes in localized critical development factors which alter projections in one or a few study areas will not invalidate the entire projection effort.

Study areas should also follow clearly visible features of the natural or man-made environment so that future surveys can utilize them. Because of the nature of the district under study (i.e.,a sparsely populated, semi-rural district, but one facing future growth) census tract divisions do not generally have practical value in establishing study areas. While school attendance boundaries are likewise not used as criteria for drawing study areas, relationships between schools should be noted.

Once the study areas are established, total acreage should be measured, and total developed acreage should be measured or calculated by study area. (See appendix.)

Step E - Re-examination of Critical Development Factors

Those factors identified in Step C and used in Step D to establish the study areas must be researched and analyzed in more detail. Information must be gathered from affected governmental agencies, developers whose subdivisions have been approved, etc., to assess the nature and degree of influence that each factor may exert. Each of the critical development factors must then be described in detail and catalouged according to the study area, or areas, it is expected to affect. (See appendix.)

Step F - Growth Rate Estimates

Staff and land use committee members must estimate future development by making subjective appraisals of the critical devlopment factors and by using their own knowledge of the local area. The estimates must be made in the form of the percent of vacant land that will be developed in each study area at five year intervals. A high percent of vacant land to be developed, a medium percent and a low percent must be estimated for each study area. In most cases, the three rates can be based on development factors which would influence devlopment and cause it to proceed at a particular rate. In some study areas where subdivisions have been approved, these estimates may be based on hard data.

In other areas, where no particular factor seems critical to development, high, medium and low growth rates must be predicted to anticipate future housing market conditions and unforeseen development factors. (See appendix.)

Step G - Formulation and Measurement of Land Use Alternatives

Land use alternatives must be formulated which take into account specific uses of land as they have been defined by differing public development policies. These may include existing zonings of district governmental agencies, proposed general plans, or a combination of both. Once these alternatives have been entered on maps of the district, it is necessary to determine the size of those portions, in acres, which allow residential construction.

Figure 2 offers a hypothetical study area which has been divided into development categories allowable under Alternative A, the General Plan alternative. First, acreage of residential regions must be measured:

Region A (Multiple Family) -	50 acres
Region B (Single Family) -	300 acres
Region C (Multiple Family) -	50 acres
Region D (Single Family) -	250 acres

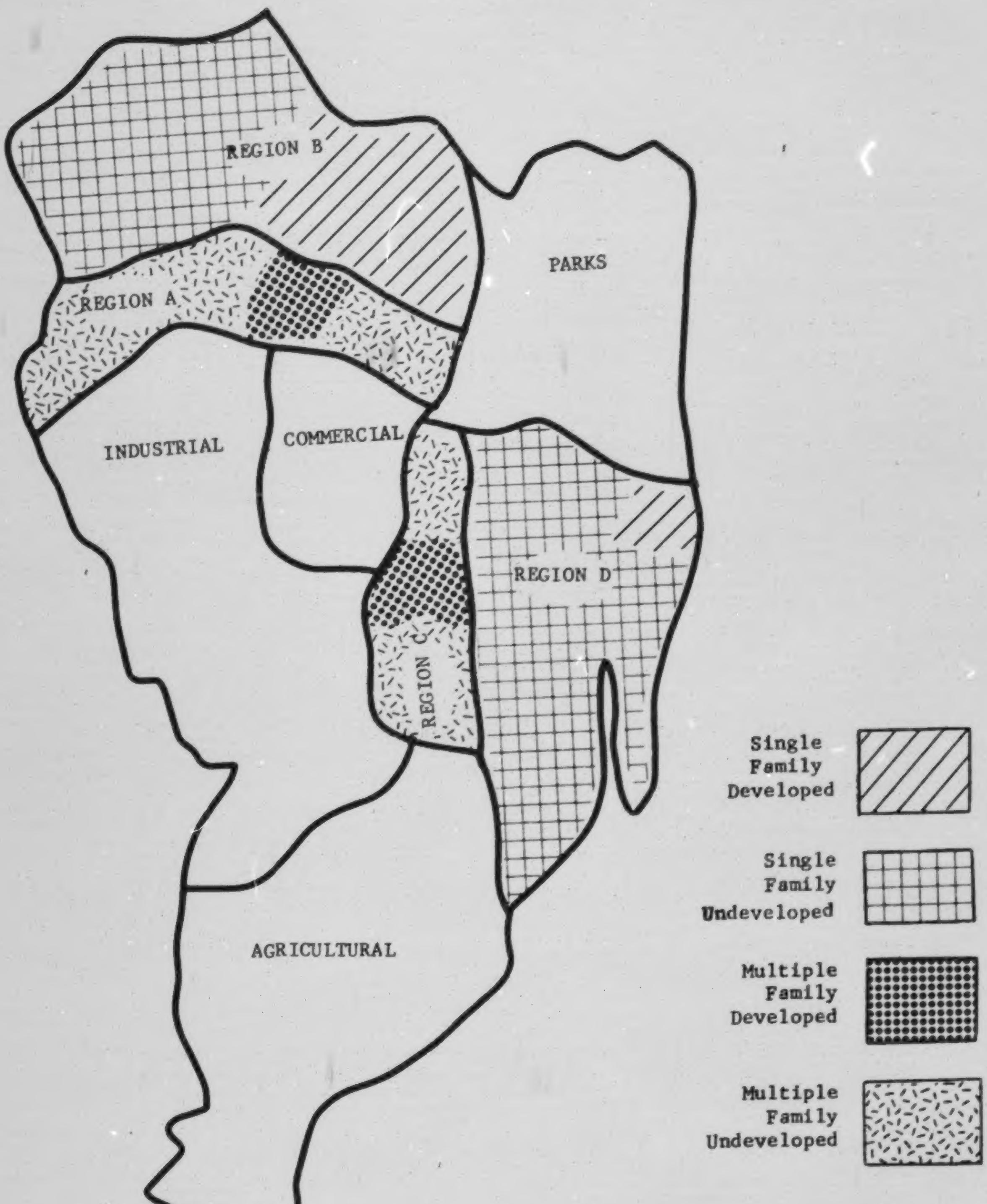
(Note: To simplify the calculations that follow, only two types of residential dwelling units have been identified--single family dwellings and multiple family dwellings. Many other types, such as condominiums, mobile homes, etc., may be identified and used in the calculations that follow.)

In all instances, it is necessary to consider Region E, that area designated for agriculture. In this area, construction of single family dwellings may be possible. Frequently, however, the minimum parcel size for such an area is quite high, thus indicating that the jurisdiction in question is attempting to maintain the area for agriculture by preventing the construction types that would ultimately lead to urbanization. However, land use decision makers often reverse themselves and let urbanization occur. Therefore, construction will frequently take place and the area cannot be ignored for projection purposes. If, however, the lot size is under ten acres, construction in the area could be extensive and projections for the area should be made.

Construction in this "agriculture" area would occur at a vastly different density than that in those adjacent "single family" regions. The single family regions would probably have a density of around 4-8 units per acre, while in the agriculture region, the density would be closer to one unit per two or three acres. Therefore, in addition to separating portions of a study area by type, it is necessary to distinguish them by density within type. (Note: The following calculations will assume that no construction will occur in the agriculture region during the projection period.)

Figure 2

STUDY AREA X
(Alternative A)


REGION B
PARKS
REGION A
INDUSTRIAL
COMMERCIAL
REGION D
REGION C
AGRICULTURAL
Single Family Developed
Single Family Undeveloped
Multiple Family Developed
Multiple Family Undeveloped

Once total acreage of regions is measured, it is necessary to estimate the amount of acreage already developed in each region, and hence, unavailable for future development:

Region A (Multiple Family)	-	20% developed
Region B (Single Family)	-	50% developed
Region C (Multiple Family)	-	20% developed
Region D (Single Family)	-	5% developed

Finally, the percentage of land allocated to streets, utilities, etc., must be subtracted from the vacant land available for residential development. Such percentages might best be learned by consulting the appropriate local jurisdiction.

A summary of the calculation used in determining the sample study area's acreage available for residential development, by region, follows:

	(1) total acres	(2) percent already developed	(3) (1) x (2) = land already developed
Region A	50 acres	20% developed	10 acres
Region B	300 acres	50% developed	150 acres
Region C	50 acres	20% developed	10 acres
Region D	250 acres	5% developed	12 acres

	(4) (1) - (3) = vacant land available	(5) percent for streets	(6) (4) x (5) = land for streets
Region A	40 acres	15%	6 acres
Region B	150 acres	20%	30 acres
Region C	40 acres	15%	6 acres
Region D	238 acres	20%	47 acres

	(7) (4) - (6) = land available for development under Alternative A
Region A	34 acres
Region B	120 acres
Region C	34 acres
Region D	191 acres

As a final refinement, the totals for Regions A and C are summed to learn the total number of acres available for multiple family dwelling development under Alternative A, and the totals for Regions B and D are summed to learn the total for single family dwelling development:

Region A - 34 acres
Region C - 34 acres
68 acres (MFD)

Region B - 120 acres
Region D - 191 acres
311 acres (SFD)

(Note: As stated earlier in the discussion of agriculture areas, should densities for regions differ even though they are of the same residential type, the acreage totals must be retained separately so that the appropriate density can be applied in Step J - Dwelling Units to be Constructed.)

To summarize, land use alternatives must be formulated which take into account specific uses of land as they have been defined by differing public development policies. Once these alternatives have been formulated, the measurements and calculations illustrated above must be done for each. Because of the vast array of possibilities, a computer should be used for this step, as well as Steps H and J. Output of Step G must be in the form of Acres Available for Development by Alternative, by Type, by Study Area. (See appendix.)

Step H - Acres to be Developed Calculation

To calculate acres to be developed, growth rates generated in Step F and land use alternatives generated in Step G are combined to produce sets of development possibilities by study area, by type, by five year interval.

A sample calculation, using Study Area X and its hypothetical land use Alternative A follows. (Note: For illustrative purposes, staff and committee estimates for growth rates in Study Area X will be placed at 30% (high), 20% (medium), and 10% (low) for the first five year period.)

percentage of vacant land to be developed in first five years		Alternative A acres available for development		acres to be developed in the first five year period in Study Area X, by type, by growth rate percentage
30%	x	68 acres MFD 311 acres SFD	=	20 acres MFD development 93 acres SFD development
20%	x	68 acres MFD 311 acres SFD	=	13 acres MFD development 62 acres SFD development
10%	x	68 acres MFD 311 acres SFD	=	8 acres MFD development 31 acres SFD development

The above calculation must be repeated for each land use alternative. Thus, if three land use alternatives were formulated and measured in Step G, Step H would produce nine sets of "acres to be developed in the first five years by study area, by type." (See appendix.)

Step I - Dwelling Unit Densities

Dwelling unit densities, the number of dwelling units per acre allowable under each land use policy (land use alternative), must be determined by consulting with appropriate local jurisdiction. The zoning ordinance of the appropriate jurisdiction will contain the maximum allowable densities. However, many developments do not utilize the maximum density so the city's planning department should be consulted to determine what the most realistic density is. The General Plan document, nearly always a map and sometimes accompanied by a text, will outline the densities planned for in each residential category.

Step J - Dwelling Units to be Constructed

To calculate the number of new dwellings to be built by type, by study area, by five year period, the number of acres that will be developed must be multiplied by the dwelling unit density allowable under land use policy. (Again, sample calculations will be done using totals produced in above hypothetical calculations. Also, for illustrative pruposes, DUD (dwelling unit density) under Alternative A will be set at the following.)

Multiple Family Dwellings per acre - 20
Single Family Dwellings per acre - 5

Dwelling units to be constructed in Study Area X are calculated in the following manner:

Acres to be developed in 1st 5 yrs. in Study Area X		DUD allowable under land use Alternative A		Number of new dwelling units to be constructed in Study Area X, 1st 5 yrs.
20 MFD acres to develop	x	20 MFD per acre	=	400 MFD units
93 SFD acres to develop		5 SFD per acre		465 SFD units
13 MFD acres to develop	x	20 MFD per acre	=	260 MFD units
62 SFD acres to develop		5 SFD per acre		310 SFD units
8 MFD acres to develop	x	20 MFD per acre	=	160 MFD units
31 SFD acres to develop		5 SFD per acre		155 SFD units

Again, the above calculations must be repeated for each land use alternative and for each study area.

Step K - Refinement of Land Use Analysis Output

First, from the array of groupings of possible number of new dwelling units, staff and committee must select the highest number of units, the lowest, and any number in between that seems "most likely" based on their subjective appraisal of development factors and general knowledge of the district.

For the sample array below, Alternative A totals are those produced by the previous sample calculations. Hypothetical totals used for Alternative B and C in sample array would be produced by performing identical calculations.

STUDY AREA X (first five years)

	high	medium	low
Alternative A	400 MFD units	260 MFD units	160 MFD units
	465 SFD units	310 SFD units	155 SFD units
Alternative B	300 MFD units	200 MFD units	100 MFD units
	400 SFD units	250 SFD units	90 SFD units
Alternative C	500 MFD units	300 MFD units	250 MFD units
	550 SFD units	400 SFD units	200 SFD units

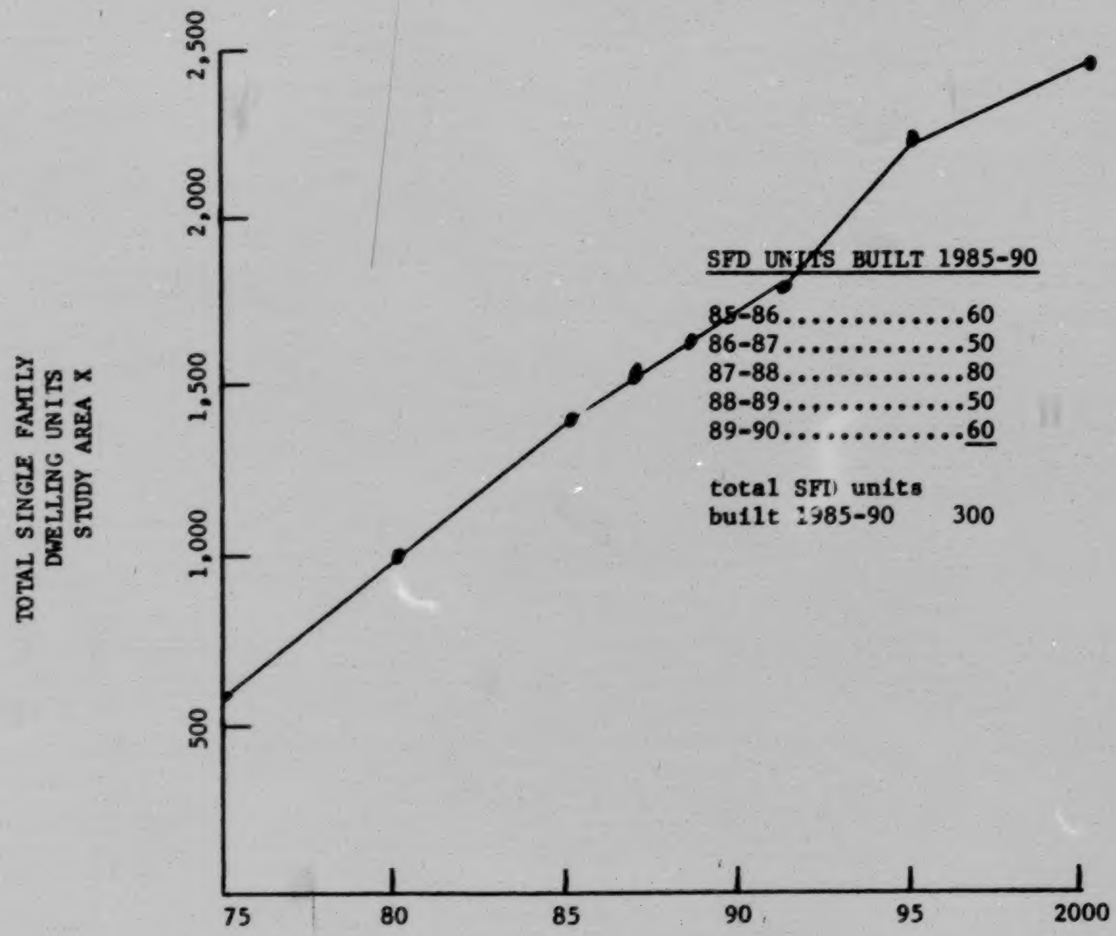
Thus, Step K would produce a fourth, composite "set" of number of dwelling units to be constructed in Study Area X, by type, five...by five year interval.

	high	medium	low
Alternative D	500 MFD units	300 MFD units	100 MFD units
(composite alt.)	550 SFD units	400 SFD units	90 SFD units

The "sets" of "number of dwelling units to be constructed by study area, by type, by five year interval" produced in Steps J and K (Alternatives A, B and C and composite alternative D) become separate inputs into later steps of the ENSIM Model. That is, each "set of three-valued development projections" provides the input necessary for a complete run of the ENSIM Model. Therefore, if there were three land use alternatives plus one composite alternative, the remaining steps of the ENSIM Model would be run four times.

However, there is one more refinement before moving on to Step Two of the ENSIM Model. Because development projections produced in the land use analysis have been calculated in five year intervals and because the remaining steps of ENSIM require annual development totals, yearly figures must first be interpolated. This is accomplished by graphing five year development totals over the entire projection period. Figure 3 provides a sample graphing procedure for calculating "most likely" annual development totals of single family dwellings under Alternative D (composite alternative). The first five year totals are those calculated in the above example. The second, third, fourth and fifth hypothetical five year totals would be achieved through identical means. (See appendix .)

Figure 3
ALTERNATIVE D ("most likely")



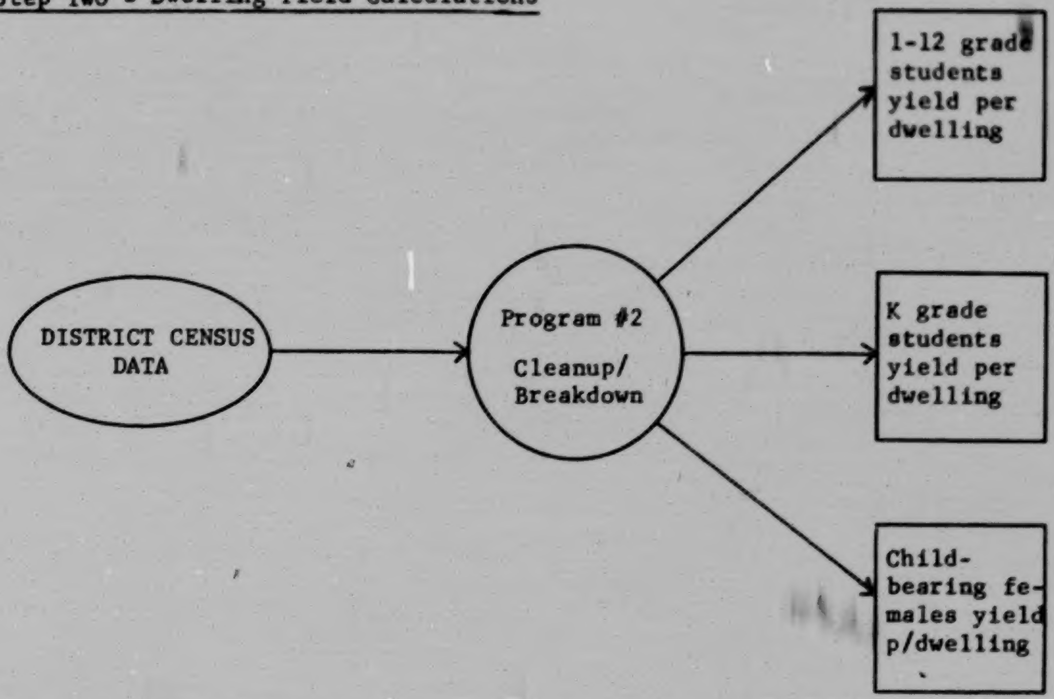
SFD UNITS BUILT 1985-90

85-86	60
86-87	50
87-88	80
88-89	50
89-90	60
total SFD units built 1985-90	300

EXISTING SFD UNITS AND FIVE YEAR TOTALS

Existing SFD units in 1975	6,000
SFD units built '75-80	400
SFD units built '80-85	400
SFD units built '85-90	300
SFD units built '90-95	500
SFD units built '90-2000	200

Step Two - Dwelling Yield Calculations


DISTRICT CENSUS DATA
Program #2
Cleanup/
Breakdown
1-12 grade students yield per dwelling
K grade students yield per dwelling
Child-bearing females yield p/dwelling

To obtain the dwelling yield values needed for input in the next three steps, an analysis of school district census data must first be completed. The census data analyzed are: (1) type of dwelling unit; (2) sex of residents; (3) age of residents.

For the initial run of the ENSIM Model, data was used from a 100% census of a neighboring elementary district in Santa Clara County, California. The three variables sought in the analysis were:

1. The average number of students in each grade from grade 1 to grade 12 per dwelling type, per new dwelling;
2. The average number of preschool age children of each age from birth to age four per dwelling type, per new dwelling;
3. The average number of females in six age groups, between the ages of 15 and 44, per dwelling type.

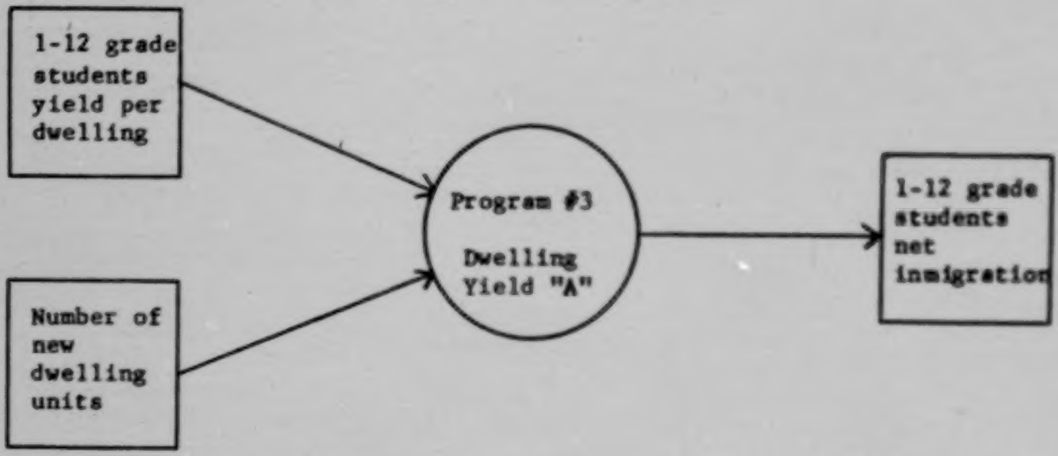
These yield values were calculated by the Statistical Package for the Social Sciences (1970), Version 5.00, subprogram BREAKDOWN. Prior to placing the raw census data into the SPSS program, a program called CLEANUP was used to prepare the data. CLEANUP changes all alpha characters to blanks, removes all cases where the dwelling unit is vacant, identifies those cases where the family has moved into a new dwelling in the last two years, sums the number of children in each age level from 1-17, and places the females in six groups according to age. Other data passed on by CLEANUP includes the tract, area and block number, number of persons living in the dwelling, type of dwelling, race of occupant, age of dwelling, length of time lived at present address and total family income.

The BREAKDOWN Subprogram calculates the sums, means, standard deviations and variance for each criterion variable and each subpopulation. The criterion variables were the three baseline variables described above. The subpopulations consist of those persons living in each of the five dwelling types. A 98% confidence interval (3 standard errors of the mean) was calculated for each mean value by the following formula:

$$98\% \text{ confidence} = 3 \times \frac{\text{Standard Deviation}}{\text{Sample Size}}$$

The 98% confidence value is used in the DWELLING YIELD programs (programs 3, 4 and 5) to derive a high and low value for each yield value calculated by the BREAKDOWN subprogram. The high value is the mean plus the 98% confidence value and the low value is the mean minus the 98% confidence value.

Step Three - Grades 1-12 Inmigration Prediction


1-12 grade students yield per dwelling
Number of new dwelling units
Program #3
Dwelling Yield "A"
1-12 grade students net inmigratio

DWELLING YIELD A (Program 3) calculates the number of new students that would result from new dwellings being occupied. The input data consists of:

1. The estimated number of new dwellings by dwelling type by year (the output from the LAND YIELD program, Step One);
2. The high, most likely and low yield value for each grade level, 1 to 12 by dwelling type (the output from the CLEANUP/BREAKDOWN program, Step Two).

The three yield values for each grade level and dwelling type are multiplied times the three estimates for the number of dwellings by dwelling type for each predicted year:

high yield value by grade by dwelling type x high estimate of new dwellings by dwelling type = high # of students by grade by dwelling type

most likely yield values by grade by dwelling type x most likely estimate of new dwellings by dwelling type = most likely # of students by grade by dwelling type

low yield value by grade by dwelling type x low estimate of new dwellings by dwelling type = low # of students by grade by dwelling type

Next, the high, most likely and low values are summed across dwelling types. In the case of Morgan Hill, where two types were used:

high number of 1-12 students p/single family dwelling x high # of 1-12 students p/mutiple family dwelling = high estimate of # of 1-12 grade students to immigrate in given yr.

most likely # of 1-12 students p/single family dwelling x most likely # of 1-12 students p/multiple family dwelling = most likely estimate of 1-12 grade students to immigrate in a given yr.

low number of 1-12 students p/single family dwelling x low number of 1-12 students p/multiple family dwelling = low estimate of # of 1-12 grade students to immigrate in a given yr.

The output consists of a high, most likely and low estimate of the number of students in grades 1 to 12 to migrate into the district in any given year. These values then become the input variable V 5.0 Net Migration for Step Six, The Denham Enrollment Simulation Program.

Figure 4 shows the yield value input data for grades 1-12 derived from the SPSS Breakdown program. Dwelling type 1 refers to single family dwellings and type 2 refers to multiple family dwellings.

Figure 5 shows one year's projected number of new students in grades 1-12 based on the construction and occupancy of between 300 and 650 single family and 50 and 350 multiple family dwellings. The calculations indicate a 98% probability that the new student immigration will fall between the high and low figure in each grade level.

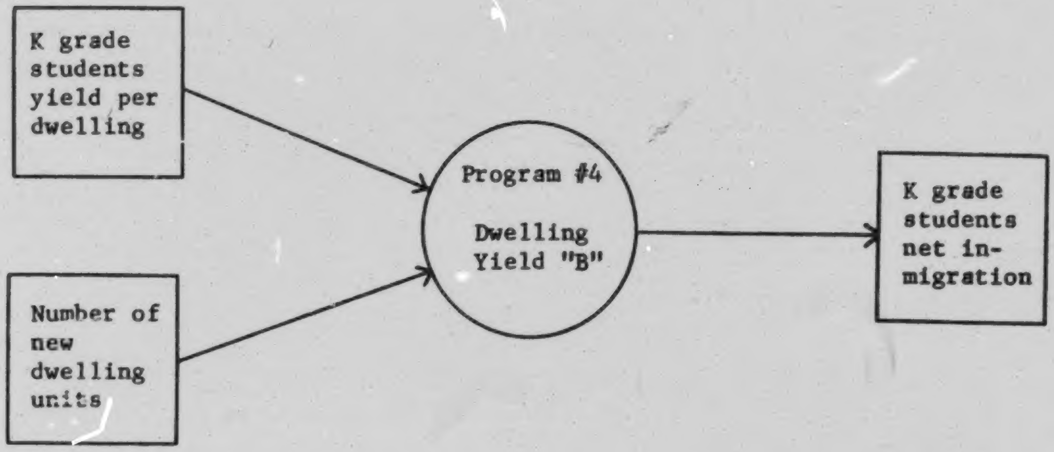
Figure 4
Morgan Hill Unified School District

```
********** YIELD VALUE INPUT **********


DWELLING       GRADE 1                GRADE 2                GRADE 3                GRADE 4                GRADE 5
 TYPE     HIGH   MED    LOW     HIGH   MED    LOW     HIGH   MED    LOW     HIGH   MED    LOW     HIGH   MED    LOW

  1     0.1112 0.0957 0.0802  0.1036 0.0874 0.0712  0.1099 0.0932 0.0765  0.0978 0.0817 0.0656  0.1035 0.0871 0.0707

  2     0.0662 0.0381 0.0100  0.0788 0.0476 0.0164  0.0662 0.0381 0.0100  0.0927 0.0571 0.0215  0.0496 0.0262 0.0028


                           ********** YIELD VALUE INPUT **********


DWELLING       GRADE 6                GRADE 7                GRADE 8                GRADE 9                GRADE 10
 TYPE     HIGH   MED    LOW     HIGH   MED    LOW     HIGH   MED    LOW     HIGH   MED    LOW     HIGH   MED    LOW

  1     0.0813 0.0666 0.0519  0.0814 0.0670 0.0526  0.0793 0.0652 0.0511  0.0623 0.0498 0.0373  0.0558 0.0441 0.0324

  2     0.0583 0.0310 0.0037  0.0426 0.0214 0.0002  0.0426 0.0214 0.0002  0.0426 0.0214 0.0002  0.0433 0.0219-0.0005


                           ********** YIELD VALUE INPUT **********


DWELLING       GRADE 11               GRADE 12
 TYPE     HIGH   MED    LOW     HIGH   MED    LOW
  1     0.0559 0.0437 0.0315  0.0445 0.0340 0.0235
  2     0.0275 0.0119-0.0037  0.0415 0.0190-0.0035
```

Figure 5
Morgan Hill Unified School District
1973 Projection

```
*********** HOUSING DATA INPUT ***********

STUDY      SINGLE FAMILY          MULTIPLE FAMILY
AREA        HIGH   MED    LOW      HIGH   MED    LOW
    0      650.   500.   300.      350.   300.    50.


STUDY           GRADE 1                 GRADE 2                 GRADE 3                 GRADE 4                 GRADE 5
AREA        HIGH   MED    LOW      HIGH   MED    LOW      HIGH   MED    LOW      HIGH   MED    LOW      HIGH   MED    LOW

TOTAL        95     59     25       95     58     22       95     58     23       96     58     21       85     51     21


STUDY           GRADE 6                 GRADE 7                 GRADE 8                 GRADE 9                 GRADE 10
AREA        HIGH   MED    LOW      HIGH   MED    LOW      HIGH   MED    LOW      HIGH   MED    LOW      HIGH   MED    LOW

TOTAL        73     43     16       68     40     16       66     39     15       55     31     11       51     28     10


STUDY           GRADE 11                GRADE 12                TOTAL
AREA        HIGH   MED    LOW      HIGH   MED    LOW      HIGH   MED    LOW
TOTAL        46     25      9       43     23      7      868    513    156
```

Step Four - Grade K Inmigration Prediction


K grade students yield per dwelling
Number of new dwelling units
Program #4
Dwelling Yield "B"
K grade students net in-migration

The Dwelling Yield B program, computer program number four, calculates the number of new grade K students that would result from new dwellings being occupied each year of the simulation. The input data is the same as was used in the Dwelling Yield #1 Step Three, except that new housing data is needed each year for 5 years prior to the first predicted year. Yield values are needed for six age groups:

1. birth to one
2. one to two
3. two to three
4. three to four
5. four to five
6. five to six

The yield values for the Morgan Hill study are shown in Figure 6. The high, medium and low predicted number of new children by age group by each year of the prediction study plus five years prior to the first predicted year is shown in Figure 7.

Children born 5 years prior to the predicted year who inmigrated into the district in the ensuing five years must be summed. If, for example, the predicted year was 1985, the formula for predicting the number of K students other than those born in the district (those born in the district will be added to the total in Step Six) who were entering the school system that year would be:

0-1 yr. olds who inmigrated in 1980	1-2 yr. olds who inmigrated in 1981	2-3 yr. olds who inmigrated in 1982	3-4 yr. olds who inmigrated in 1983	4-5 yr. olds who inmigrated in 1984	5-6 yr. olds who inmigrated in 1985	Total # of K students entering the district in 1985

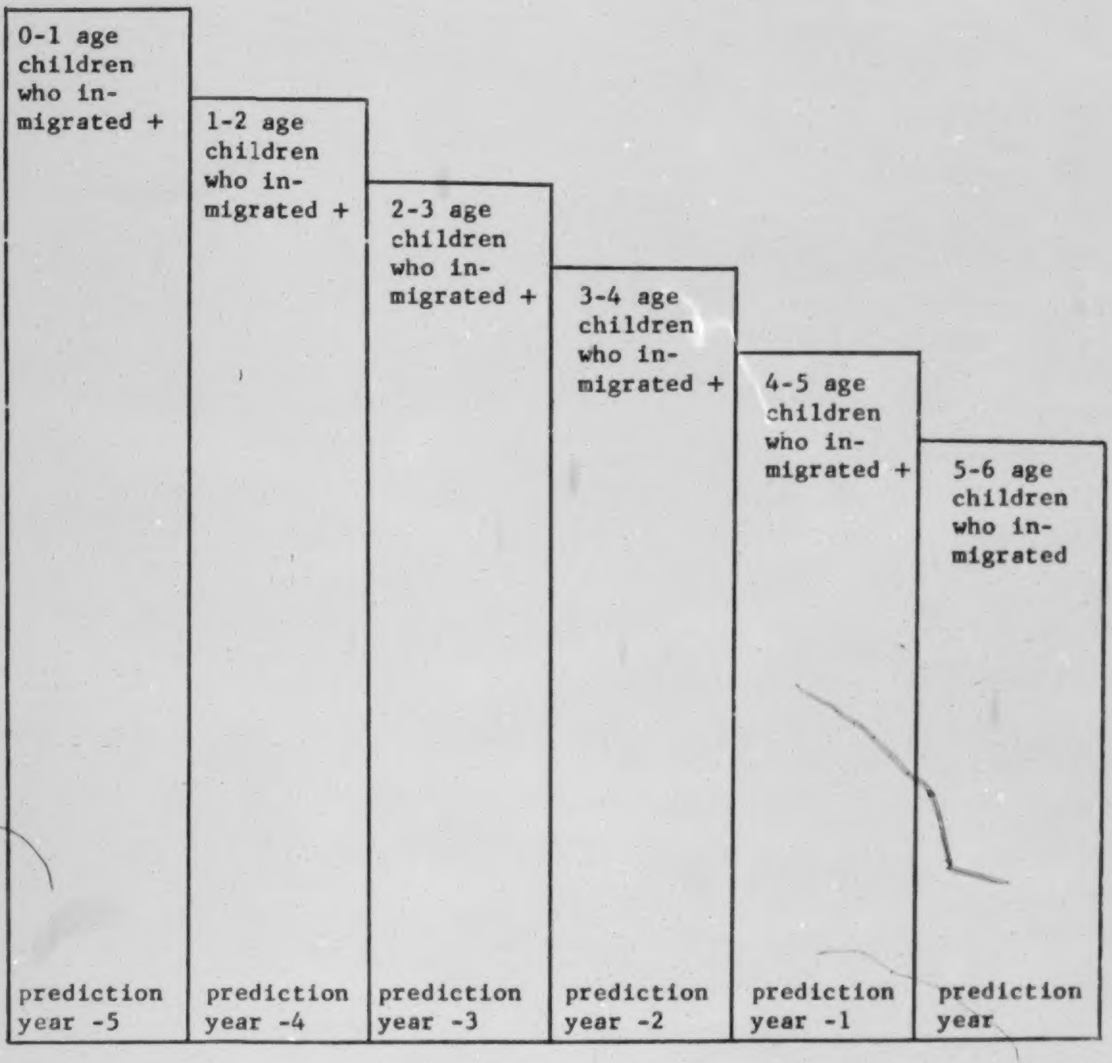
Figure 6
Morgan Hill Unified School District
Predicted Grade K Inmigration

```
                            ********** YIELD VALUE INPUT **********


DWELLING       1968                  1969                  1970                  1971                  1972
 TYPE    HIGH   MED   LOW      HIGH   MED   LOW      HIGH   MED   LOW      HIGH   MED   LOW      HIGH   MED   LOW

  1     0.1392 0.1200 0.1008  0.1448 0.1256 0.1064  0.1746 0.1542 0.1338  0.1678 0.1480 0.1282  0.1499 0.1307 0.1115

  2     0.1302 0.0900 0.0498  0.1308 0.0906 0.0504  0.1033 0.0667 0.0301  0.0754 0.0475 0.0196  0.0939 0.0645 0.0351


DWELLING       1973
 TYPE    HIGH   MED   LOW
  1     0.1406 0.1218 0.1030
  2     0.0629 0.0357 0.0085
```

Figure 7
Morgan Hill Unified School District
Predicted Grade K Immigration
District Total

********** INMIGRATION BY AGE BY YEAR **********

PRED. YEAR	YEAR	AGE 0 HIGH	AGE 0 MED	AGE 0 LOW	AGE 1 HIGH	AGE 1 MED	AGE 1 LOW	AGE 2 HIGH	AGE 2 MED	AGE 2 LOW	AGE 3 HIGH	AGE 3 MED	AGE 3 LOW	AGE 4 HIGH	AGE 4 MED	AGE 4 LOW	AGE 5 HIGH	AGE 5 MED	AGE 5 LOW
-5	1968	9	5	3	9	5	3	10	6	3	9	6	3	9	5	3	8	5	3
-4	1969	22	17	13	23	18	14	26	21	17	24	20	16	22	18	14	20	16	12
-3	1970	36	28	22	37	30	23	41	34	27	39	32	26	36	29	23	32	26	20
-2	1971	56	45	34	58	47	36	64	53	42	59	49	40	56	46	36	49	40	31
-1	1972	85	61	40	88	64	42	95	72	52	86	66	45	82	62	44	72	54	39
1	1973	136	87	33	140	90	34	150	97	42	135	88	39	130	85	35	113	72	31
2	1974	211	100	28	217	104	30	231	107	35	209	95	33	202	94	30	175	77	26
3	1975	294	115	21	303	119	22	333	122	25	305	108	24	289	108	22	256	87	19
4	1976	356	183	38	366	189	40	396	208	48	360	190	46	344	181	41	301	155	36
5	1977	382	211	53	393	219	56	416	242	68	375	222	65	363	210	58	314	181	52
6	1978	395	247	53	406	257	56	427	280	68	383	267	65	372	249	58	320	218	52
7	1979	395	307	48	406	319	51	427	365	62	383	341	58	372	314	52	320	278	47
8	1980	376	247	48	386	257	51	411	288	62	371	267	58	358	249	52	311	218	47
9	1981	479	213	55	493	221	58	534	237	71	487	215	67	465	207	60	408	175	54
10	1982	471	189	50	485	195	53	522	207	64	474	186	61	454	181	54	397	150	49
11	1983	471	177	55	485	183	58	522	191	71	474	171	67	454	168	60	397	138	54
12	1984	452	165	55	465	170	58	507	176	71	463	156	67	440	155	60	388	126	54
13	1985	478	179	55	492	185	58	531	195	71	483	176	68	462	171	60	404	143	54
14	1986	613	198	54	631	205	57	679	225	69	616	206	65	591	196	58	516	168	52
15	1987	613	217	54	631	226	57	679	253	69	616	233	65	591	218	58	516	190	52


0-1 age children who in-migrated +
1-2 age children who in-migrated +
2-3 age children who in-migrated +
3-4 age children who in-migrated +
4-5 age children who in-migrated +
5-6 age children who in-migrated
prediction year -5
prediction year -4
prediction year -3
prediction year -2
prediction year -1
prediction year

The number of children in each of the six age groups is calculated by multiplying a yield value for that age group times the number of new dwellings:

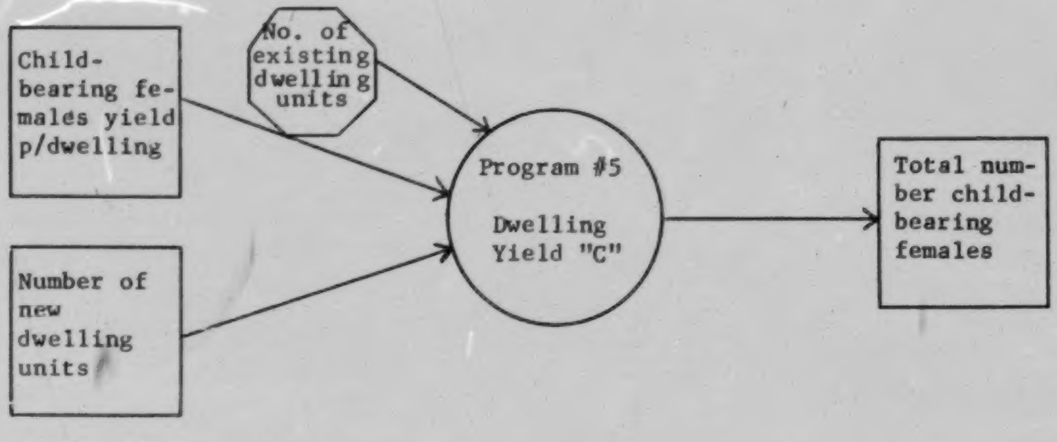
yield per dwelling by age group (output of Step Two)	x	number of new dwellings (output of Step One)	=	number of children each of six age groups

The output consists of a high, most likely and low estimate of the number of children to be available for grade K each year of the simulation because of inmigration. These values are the input variables V 4.0. Net Preschool Migration to the Denham Program, program 6. The output for the Morgan Hill Unified School District study is shown in Figure 8.

Figure 8
Morgan Hill Unified School District
Predicted Grade K Inmigration
District Total

```
STUDY           1973                  1974                  1975                  1976                  1977
AREA     HIGH   MED   LOW      HIGH   MED   LOW      HIGH   MED   LOW      HIGH   MED   LOW      HIGH   MED   LOW

  99      327   240   159       514   328   188       782   416   198      1093   564   209      1419   728   226


STUDY           1978                  1979                  1980                  1981                  1982
AREA     HIGH   MED   LOW      HIGH   MED   LOW      HIGH   MED   LOW      HIGH   MED   LOW      HIGH   MED   LCW

  99     1729   931   244      1977  1176   268      2142  1345   293      2325  1455   326      2448  1457   338


STUDY           1983                  1984                  1985                  1986                  1987
AREA     HIGH   MED   LOW      HIGH   MED   LCW      HIGH   MEC   LOW      HIGH   MED   LOW      HIGH   MED   LCW

  99     2550  1388   341      2631  1281   345      27C9  1144   351      2927  1094   358      3053  1110   357
CORE USAGE       OBJECT CODE=    6752 BYTES,ARRAY AREA=   18952 BYTES,TOTAL AREA AVAILABLE=  106624  BYTES

COMPILE TIME=     0.79 SEC,EXECLTION TIME=     1.36 SEC,  WATFIV - VERSICA 1 LEVEL 1 JANUARY  1970     DATE=  74/031
```

Step Five - Total Numbers Child-Bearing Females Prediction


Child-bearing females yield p/dwelling
No. of existing dwelling units
Number of new dwelling units
Program #5
Dwelling Yield "C"
Total number child-bearing females

The Dwelling Yield C program, computer program 5, calculates the total number of child-bearing aged females living in the district during the prediction years. Females fall into six age groups:

1. 15-19 years
2. 20-24 years
3. 25-29 years
4. 30-34 years
5. 35-39 years
6. 40-44 years

Input for Step Five consists of:

> Input #1 the high, most likely and low number of dwellings, by dwelling type, existing as of December in the first predicted year, minus two years.
>
> Input #2 the estimated number (high, most likely and low) of new dwellings, by dwelling type, by year (output of Land Yield Program, Step one.) These values are required for the base year of the prediction study and all other years, except the last five years to be predicted.
>
> Input #3 the estimated high, most likely and low yield values, by female age group, by dwelling type (output of Step Two).

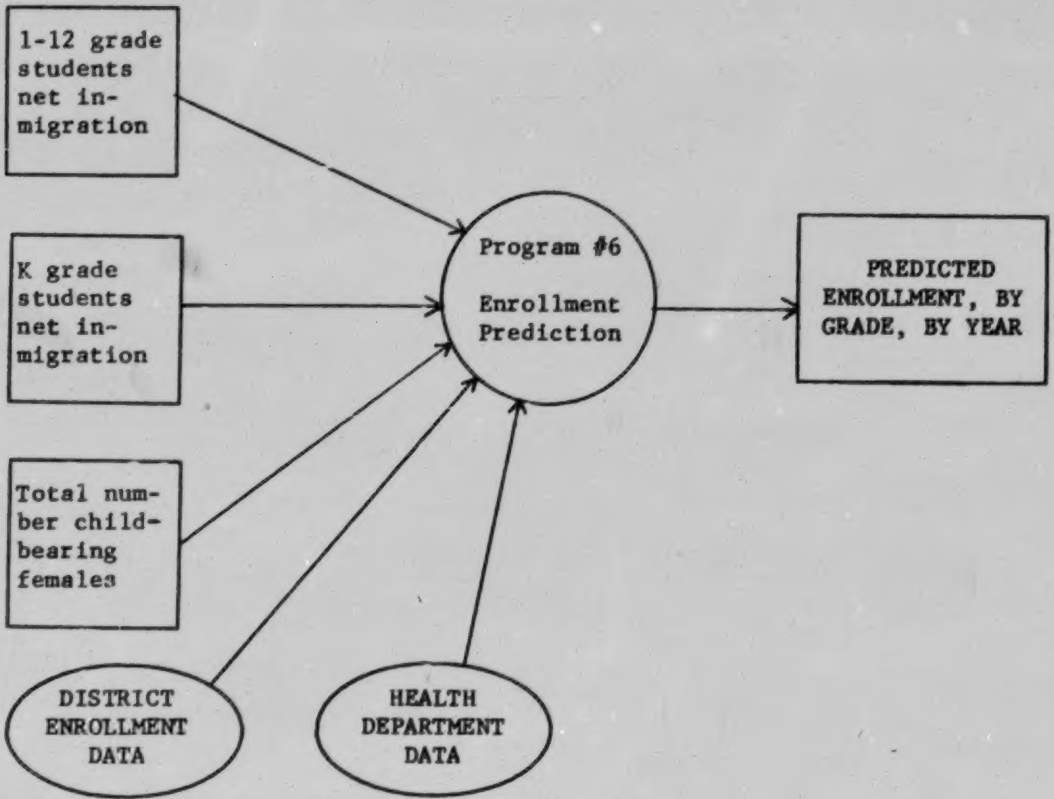
The first calculation in Step Five provides estimates of the total number of dwellings, by type, expected to exist in the district in each of the prediction years. This is achieved by adding Input #1, and Input #2 sequentially. Figure 8a offers the formula for predicting the total number of dwellings if the predicted year was 1976 and the base year was 1974.

The second calculation in Step Five provides estimates of the total number of child-bearing aged females, by age group, by dwelling type, living in the district in each of the prediction years. This is achieved by multiplying the output of the above calculation (total number of dwellings, by type, existing in the district in each prediction year) by Input #3 (estimated yield values by female age group, by dwelling type.) Figure 8b offers the formula for predicting the total number of 25-29 year old females living in the district if the predicted year is again 1976.

Once the total number of females, by age group, by year, by dwelling type is calculated, dwelling type totals can be summed to provide input for Step Six.

(The high, medium and low predicted number of single family and multiple family dwellings and the high, medium and low predicted number of females in each of the six age groups for the base year of the Morgan Hill study are shown in Figures 9 and 10.)

Step Six - Enrollment Projection


1-12 grade students net in-migration
K grade students net in-migration
Total number child-bearing females
DISTRICT ENROLLMENT DATA
HEALTH DEPARTMENT DATA
Program #6
Enrollment Prediction
PREDICTED ENROLLMENT, BY GRADE, BY YEAR

As shown above, input into the sixth computer program of ENSIM includes:

1. Net inmigration of grade 1-12 students
2. Net inmigration of grade K students
3. Total number of child-bearing aged females
4. School district enrollment data
5. County Health Department data

Figure 8a

SAMPLE CALCULATION FOR ESTIMATING TOTAL NUMBER OF DWELLINGS

Input #1		Input #2		Input #2		Input #2		Input #2		Output
high number of dwellings, by type, as of Dec. 1972	+	high number of new dwellings, by dwelling type estimated for '73	+	high number of new dwellings, by dwelling type estimated for '74	+	high number of new dwellings, by dwelling type estimated for '75	+	high number of new dwellings, by dwelling type estimated for '76	=	high total number of dwellings by type for 1976
most likely number of dwellings, by type, as of Dec. 1972	+	most likely number of new dwellings, by dwelling type, estimated for 1973	+	most likely number of new dwellings, by dwelling type, estimated for 1974	+	most likely number of new dwellings, by dwelling type, estimated for 1975	+	most likely number of new dwellings, by dwelling type, estimated for 1976	=	most likely number of total dwellings, by type for 1976
low number of dwellings, by type, as of Dec. 1972	+	low number of new dwellings, by dwelling type estimated for '73	+	low number of new dwellings, by dwelling type estimated for '74	+	low number of new dwellings, by dwelling type estimated for '75	+	low number of new dwellings, by dwelling type estimated for '76	=	low total number of dwellings by type for 1976

Figure 8b

SAMPLE CALCULATION FOR ESTIMATING TOTAL NUMBER OF CHILD-BEARING AGED FEMALES (25-29 yr. olds)

Output of Above Calculation		Input #3		Output
high total number of dwellings, by type, existing in the district in 1976	+	high yield value, by dwelling type, for 25-29 year old females	=	high total number of 25-29 year old females living in the district in 1976
most likely total number of dwellings, by type existing in the district in 1976	+	most likely yield value, by dwelling type, for 25-29 year old females	=	most likely number of 25-29 year old females living in the district in 1976
low total number of dwellings, by type, existing in the district in 1976	+	low yield value, by dwelling type, for 25-29 year old females	=	low total number of 25-29 year old females living in the district in 1976

Figure 9
Morgan Hill Unified School District
Projected Number of Females in Six Age Groups

```
                        ********** YIELD VALUE INPUT **********

DWELLING      15-19YRS                    20-24YRS                    25-29YRS                    30-34YRS                    35-39YRS
 TYPE     HIGH   MED    LOW         HIGH   MED    LOW         HIGH   MED    LOW         HIGH   MED    LOW         HIGH   MED    LOW

  1     0.1199 0.1025 0.0851      0.1842 0.1600 0.1358      0.3552 0.3280 0.3008      0.2315 0.2100 0.1885      0.1252 0.1090 0.0928

  2     0.1256 0.0866 0.0476      0.3309 0.2617 0.1925      0.3267 0.2665 0.2063      0.1612 0.1180 0.0748      0.0928 0.0665 0.0402


DWELLING      40-44YRS
 TYPE     HIGH   MED    LOW
  1     0.0785 0.0650 0.0515
  2     0.0687 0.0390 0.0093
```

Figure 10
Morgan Hill Unified School District
Projected Number of Females in Six Age Groups
1972 Projection

```
                              ********** HOUSING DATA INPLT **********

STUDY      SINGLE FAMILY          MULTIPLE FAMILY
AREA         HIGH   MED   LOW       HIGH   MED   LOW
    0       3650.  3613.  3570.      783.   723.   6C0.

STUDY            15-19YRS                20-24YRS                 25-29YRS                30-34YRS                35-39YRS
AREA         HIGH   MED   LOW       HIGH   MED   LOW        HIGH   MEC   LOW       HIGH   MED   LOW        HIGH   MED   LCW

TOTAL         536   433   332        931   767   600        1552  1378  1158        971   844   718         530   442   355

STUDY            40-44YRS
AREA         HIGH   MED   LOW
TOTAL         340   263   189
```

Specifically, school district enrollment data consists of:

1. The number of children in each grade of the public schools at the beginning of school in the base year (the latest year in which data are available).

2. The number of potential kindergarten children or first graders who will enroll in non-public school in each year of the simulation.

3. Net transfer to non-public school during the previous year and grade, estimated for each grade level of each year of the simulation.

4. Estimates for each year of simulation of the proportions of students in each grade who were retained in grade at the end of the previous year and who will remain in that grade level for another year.

5. Percent of students who are dropped from the rolls because of death or institutionalization during the previous year and grade, estimated for each grade level of each year of the simulation.

6. Estimates for each year of simulation of percents of students who dropped out of school from grades seven through eleven the previous year.

Health department data consists of:

1. The number of allocated births in each of the four or five years previous to the base year, depending on whether kindergarten or first grade is the first grade level to be predicted. This assumes that figures for the base year are not available and must be predicted.

2. The number of deaths associated with these births during the first year of life.

3. The number of live births for each 1,000 females in each of six age groups five or six years previous to the year to be simulated. Separate estimates of this variable are required for each year of the simulation except those for which birth records are available.

4. The percents of preschool deaths for the births estimated using above variable and input from Step Five (total number of child-bearing aged females).

When establishing variable items (enrollments items 2 through 6 and health department items 3 and 4), user must analyze data three to five years back and establish a mean, a high and low which are usually on standard deviation above and below the mean. (Step Six requires a high, most likely and low value for each estimate.)

IV. USE OF THE ENSIM MODEL - Summary of Steps and Verification

The accuracy of a 15 year school enrollment prediction using the ENSIM Model will depend on a multitude of factors, any of which is capable of producing a sizeable error factor. Listed below is a series of steps to assist the user. Most important are those steps that deal with the verification of data. After each preliminary computer run, the output should be checked for accuracy and reliability. It is strongly recommended that the first two predicted years be years for which data already exists.

Step A - "Data Gathering"

Data collection forms for all computer programs, except those for the SPSS/CLEANUP program, are provided in Appendix B. Figure 11 presents a worksheet that will be helpful in collecting past enrollment data. A minimum of four years of past data is needed so that certain trends can be ascertained. Most important of these trends are those that deal with student mobility. The worksheet begins with the number of students enrolled in a grade level as of December 1. This figure, which is the tentative enrollment in the next grade in the next year, is then modified by new students, transfer of students, retentions in this grade and from the next, transfers to special classes or schools (special education or continuation school), and dropouts. This data is collected for each grade level for at least four years.

Step B - "Obtain Yield Values"

Run CLEANUP/Breakdown program to determine the yield values. The census data is, of course, best if it has been collected in the district under study. However, if this isn't possible, census data from a nearby district with similar characteristics will be better than none at all.

Step C - Determine Number of New Dwellings

Run Land Yield program to determine the number of new dwellings by dwelling type, for each year of the simulation.

Step D - Verify Dwelling Number and Yield Values

This is perhaps the most important step in the ENSIM Model. If mistakes have been made in Steps 1 through 3, no amount of correction or adjustment will improve the prediction accuracy.

Step E - Run Dwelling Yields A, B and C (Computer Programs 3, 4 and 5)

These programs should be run at approximately the same time. Check output against enrollment worksheet. The grade K and grades 1-12 dwelling yield values should be close to the new student values on the worksheet. (Appendix B provides data collection forms.)

Figure 11

ENROLLMENT WORKSHEET

GRADE______

Actual Year					
Predicted Year	-3	-2	-1	1	2
Enrollment as of Dec. 1					
New students					
Transfer out students					
Retained in this grade					
Retained from next grade					
Drop outs Gr. 7 - 11 only					
Transfers to special class or school					
Enrollment next Dec. in next grade					
Net change					

Step F - Test Run Enrollment Prediction Program (Computer Program 6)

If the "Number of Years" variable in program 6 is set for 15, a trial run of two or three years can be made by setting the time estimate on the JOB card to 20% of the time required for a fifteen year prediction. (.4 minutes were used in the test run.) In this way, all input data will be listed, as will the predicted enrollment by grade level for the first two years.

Step G - Final Check Out

Compare each grade level's actual enrollment with the predicted enrollment. If the actual enrollment value falls outside the 95% confidence limits of the predicted value, four sources of errors exist:

1. Incorrect yield values
2. Incorrect number of new dwellings occupied
3. Immigrating students may be enrolling in private schools or no schools at all
4. Incorrect student mobility data involving retentions, dropouts and transfers to special classes

Step H - Run Enrollment Prediction Program (Computer Program 6)

V. USE OF THE ENSIM COMPUTER PROGRAMS

The computer programs used in the ENSIM Model have been tested and used on an IBM 360/67 computer located at the Stanford Center for Information Processing at Stanford University. The programs are written in Fortran IV, level H language. Execution time and compiler for each of the programs are shown below:

Program	Compiler	Execution Time
LAND YIELD (#1)	Watfiv	.06 min.
CLEANUP/ BREAKDOWN(#2)	Fortran/ SPSS	3.00 Min. (Approx) 1.12 min.
DWELLING YIELD A (#3)	Watfiv	.05 min.
DWELLING YIELD B (#4)	Watfiv	.04 min.
DWELLING YIELD C (#5)	Watfiv	.03 min.
ENROLLMENT PREDICTION (#6) (compile and linkedit)	Fortran/ level H	1.13 min.
ENROLLMENT PREDICTION (#6) (15 year prediction) (executive only)		2.40 min.

A description of programs 1, 3, 4, 5 and 6 as well as their required input follows. Although it is not possible to list the actual SPSS Breakdown program, the SPSS control cards are listed for the readers' understanding of Step Two of the ENSIM Model.

COMPUTER PROGRAM DESCRIPTIONS

PROGRAM NAME: LAND YIELD #1

Purpose: To predict the number of new dwellings by dwelling type to be constructed in a school district.

Input Data Cards	Format	Card and/or Variable Name	Description
Card 1	(20A4)	Title Card	Name of school district
Card 2	(5I1, 12I1)	Control Card	
		NCAT	Number of land use categories. 12 categories maximum.
		NTYPE	Number of dwelling types. 5 types maximum.
		NAREA	Number of study areas. 30 study areas maximum.
		NYEARS	Number of years to be predicted.
		IPUNCH	00 = no punched output; 01 = punched district totals.
		NCODE	This variable keys each land category to a dwelling type. The NCODE array has as many elements as are land use categories. Code the dwelling types the same as their sequence in Card 3; i.e., 1=single family; 2=apartments; 3=mobile homes, etc.

COMPUTER PROGRAM DESCRIPTIONS

PROGRAM NAME: Land Yield #1 (cont.)

Input Data Cards	Format	Card and/or Variable Name	Description
Card 3	(10A8)	Dwelling type names	The name of each different dwelling type. Maximum of 5 dwelling types. Each must use 16 columns.
Card 4	(20A4)	Card 7 format	Suggested format - (3X, F3.3, 12F3.0)
Card 5	(20A4)	Card 8 format	Suggested format - (3X, 12F3.2)
Card 6	(20A4)	Card 9 format	Suggested format - (3X, 12F5.2)
Card 7	Card 5	Available acres	
		DEV (I) I - study areas	The percentage of land already developed in each study area.
		ACRE (I, K) I=Study areas K=land categories	The total number of acres by land categories by study areas.

COMPUTER PROGRAM DESCRIPTIONS

PROGRAM NAME: Land Yield #1 (cont.)

Input Data Cards	Format	Card and/or Variable Name	Description
Card 8	Card 6	Streets & Utilities STREET (I,K) I = study areas K = land categories	The percentage of land to be developed that will be allocated to streets, utilities, etc., by land category by study area.
Card 9	Card 7	Density DENSIT (I,K,) I = study areas K = land categories	The density (dwellings per acre) for future construction by land category by study area.
Card 10	(20A4)	Description	A description of the study being done. Use a blank card if no special description is needed.
Card 11	(I2, 1X, 12f5.3)	Percent Land Developed AREA PDEV I = study area N = development rate	Study area number. The percentage of available land that will be developed by the rate of development by study area for each year of the study.

COMPUTER PROGRAM DESCRIPTIONS

PROGRAM NAME: DWELLING YIELD #A, #3 Grades 1-12 projection

Input Data Cards	Format	Card and/or Variable name	Description
Card 1	(20A4)	Title card	School district name.
Card 2	(5I2,I4)	Control card	
		NGRADE	Number of grade levels to be predicted. 12 years maximum.
		NYEARS	Number of years to be predicted. No limitation.
		NTYPE	Number of dwelling types. 5 types maximum.
		NAREA	Number of study areas. 30 areas maximum.
		IPUNCH	00 = no punched output. 01 = punched output by study area. 02 = punched output for total only.
		IYEAR	The first year to be predicted.
Card 3	(10A8)	Grade level titles	
		GRTITL(I) I = grade levels plus total.	Name of each grade level. The last title must be "TOTAL." Each title must take 8 columns.

COMPUTER PROGRAM DESCRIPTIONS

PROGRAM NAME: Dwelling Yield #A, #3 Grades 1-12 Projection (cont.)

Input Data Cards	Format	Card and/or Variable Name	Description
Card 4	(10A8)	Dwelling type name	The name of each dwelling type. Each name must take 16 columns.
		TYP1(I),TYP2(I) I = dwelling types	
Card 5	(10X,12F5.4/ 12F5.4)	Student yield values YIELD(I,L,M) I = dwelling types L = 2, the mean and confidence int. M = grade level	The first value is the average number of children in the first grade level for the first dwelling type. The second value is the 98% confidence interval (3 X the standard error of the mean). Complete all grade levels on the first dwelling type card then the second dwelling type.
Card 6	(8X,I2,1X, 12F5.0)	Housing Data	
		AREA(L) L = number of study areas.	Study area number. Leave blank if working with totals only.
		HOUSE(J,K) J = 3, high, med. low value. K = dwelling type	The high, most likely and low number of new dwellings by each dwelling type. Repeat Card 6, Housing data for each year to be predicted starting with IYEAR.
Card 7	(8X,I2)	End of data	Place a card with a 99 in columns 9 and 10 after the last year's housing data.

COMPUTER PROGRAM DESCRIPTIONS

PROGRAM NAME: DWELLING YIELD #B, #4 Grade K prediction.

Input data cards	Format	Card and/or Variable name	Description
Card 1	(20A4)	Title Card	The school district name.
Card 2	(4I2)	Control Card	
		NYEARS	The number of years to be predicted.
		NTYPE	The number of dwelling types.
		NAREA	The number of study areas.
		IPUNCH	00 = no punched output. 01 = punched output by study area. 04 = punched output for total only.
Card 3	(20A4)	Year title GRTITL(I) I = number of years predicted plus 5.	The year for each set of housing data. Start with the first predicted year minus five and continue through the last predicted year.

COMPUTER PROGRAM DESCRIPTIONS

PROGRAM NAME: DWELLING YIELD #B, #4 Grade K prediction (cont.)

Input Data Cards	Format	Card and/or Variable Name	Description
Card 4	(10A8)	Dwelling Title	The name of each dwelling type. Each name must take 16 columns.
		TYP1(I),TYP2(I) I = dwelling types	
Card 5	(14F5.4)	Yield Values	Six age groups values must be used. The mean and confidence interval for the first age group for each of the dwelling types is followed by the second age group card, etc.
		YIELD(I,L,M) I = dwelling types L = 2, mean and confidence int. M = 6, age groups	
Card 6	(20A4)	Area Title	The study area title or number. If study areas are not being used punch in "DISTRICT TOTAL"
Card 7	(A2,1X,I4, 1X,I2,1X, 12F5.0)	Housing Data	
		PRED(L) L = year	The year of the data in relation to the number of years to be predicted. The first year's data would be labeled -5.
		YEAR(L) L = number of predicted years +5	The actual year the data relates to.
		AREA(IA) IA = number of study areas	The study area number. Leave blank if working with district totals only.

COMPUTER PROGRAM DESCRIPTIONS

PROGRAM NAME: DWELLING YIELD #B, #4 Grade K prediction (cont.)

Input Data Cards	Format	Card and/or Variable Name	Description
Card 7 continued.		HOUSE(J,K)	The high, most likely and low number of new dwellings by each dwelling type.
		J = 3, high, med. and low value. K = dwelling type.	Repeat Card 7, House data for the number of years to be predicted plus 5.
Card 8	(8X,I2)	End of data	Place a card with a 99 in columns 9 and 10 after the last years housing data.
			Repeat cards 6, 7 and 8 for each study area.

COMPUTER PROGRAM DESCRIPTIONS

PROGRAM NAME: DWELLING YIELD #C, #5 Female population prediction

Input data cards	Format	Card and/or Variable name	Description
Card 1	(20A4)	Title card	Name of school district.
Card 2	(4I2,I4)	Control card	
		NYEARS	Number of years to be predicted. NYEAR will always be the number of years to be predicted in the Enrollment PREDICTION program minus 4.
		NTYPE	The number of housing types.
		NAREA	The number of study areas.
		IPUNCH	00 = no punched output 03 = punched output by study areas 04 = punched output for total only
		IYEAR	The first year to be predicted by this program. This would be the base year of the ENROLLMENT PREDICTION program.

PROGRAM NAME: DWELLING YIELD #C, #5 Female population prediction (cont.)

Card 3	(10A8)	Dwelling Types TYP1(I),TYP2(I) I = number of types	The name of each dwelling type. Each name must take 16 columns.
Card 4	(14F5.4)	Yield Values YIELD(I,L,M) I = dwelling type L = 2, mean and confidence int. M = 6 age groups	The mean and confidence interval yield values for each of the 6 age groups for the first dwelling type are followed by the data for each of the other dwelling types.
Card 5	(12F5.0)	Housing Base BASE(I,J,K) I = study area J = 3, high, med. and low. K = dwelling type	The high most likely and low number of dwellings by dwelling type existing as of Dec. in the first predicted year minus 2 years.
Card 6	(8X, I2, 1X, 12F5.0)	Housing Data	
		AREA(L) L = study area number	The study area number. Leave blank if working with district total only.
		HOUS(J,K) J = 3, high, med. and low. K = dwelling type	The high, most likely and low number of new dwellings by each dwelling type. These values are required for the base year of the prediction study and all other years except the last 5 years to be predicted.
Card 7	(8X,I2)	End of Data	Place a card with a 99 in columns 9 and 10 after the last housing data card. Repeat card 6 data for each study area.

COMPUTER PROGRAM DESCRIPTION

PROGRAM NAME: Enrollment Prediction Simulation #6

Purpose: To predict long term probability distributions of grade level enrollments. (Note - this input data description was taken in part from Denham (1971) Appendix C, Instructions to the User)

Input data cards	Format	Card and/or variable name	Description
Card 1	(20A4)	Title card	Columns 1-80 may be used. The title will be used as a heading on the output.
Card 2	(8X,I2,3X, I2,4X,I1,1X, I4,1X,I9)	Parameter card	
		IYEAR	Number of years to be simulated. Any integer from one to fifteen. Columns 9 - 10.
		IGRADE	Number of grade to be simulated. 12 if kindergarten is not included and 13 if it is included. This study assumes that kindergarten will be included. Columns 14-15.
		ISEX	This variable indicates the use of the sex option. 1 if yes, 0 if no. This study does not use the sex option. Column 20.
		IDATE	The first year to be simulated. Columns 22-25. 19xx
		IX	The number for random number generator. Any 9 digit odd integer. Columns 27-35.

PROGRAM NAME: Enrollment Prediction Simulation #6 (cont.)

Cards 3 to 15	(20A4)	Format cards	There is one format card for each input parameter and variable. The following formats are suggested but not required. The formats for the variables produced by the three DWELLING YIELD Programs matches the output of the DWELLING YIELD Programs.
		P1 ENROLL	(13(F3.0,1X))
		P2 BIRTHS	(4(F3.0,1X))
		P3 DEATHS	(4(F3.0,1X))
		V1 ABIRTHS, BBIRTHS, CBIRTHS	(18F4.0)
		V2 AGIRLS, BGIRLS, CGIRLS	(3X,15F5.0/3X,3F5.0) This variable is produced by DWELLING YIELD #3, Female Population Prediction.
		V3 ADEATH, BDEATH, CDEATH	(3F4.3)
		V4 APREMI, BPREMI, CPREMI	(3F4.0) This variable is produced by DWELLING YIELD #2, Grade K Prediction.
		V5 AMIGRA, BMIGRA, CMIGRA	(3X,18F3.0) This variable is produced by DWELLING YIELD #1, Grades 1-12 Prediction.
		V6 APRIVS, BPRIVS, CPRIVS	(3F4.0)
		V7 ATRANS, BTRANS, CTRANS	(18F3.0)
		V8 AHOLDS, BHOLDS, CHOLDS	(18F4.3/18F4.3/3F4.3)
		V9 AINSTI, BINSTI, CINSTI	(18F4.3)
		V10 ADROPS, BDROPS, CDROPS	(15F4.3)

PROGRAM NAME: Enrollment Prediction Simulation #6 (cont.)

Cards 16 - 19 are called Parameters.

Card 16	P1	ENROLL(I) I = grade level	The number of children in each grade level as of December 1 in the base year. (The base year is the year immediately preceding the first year of prediction).
Card 17	P2	BIRTHS(J) J = year of simulation	The number of allocated births in each of the four years previous to the base year. The first value is from the first predicted year minus five years, the second value is from the first predicted year minus four and so on.
Card 18	P3	DEATHS(J) J = year of simulation	The number of deaths for the above births.

Cards 19 - 28 are called Variables.

Card 19	V1	ABIRTH(I,J) I = age group J = year of simulation minus four	The number of live births for each 1,000 females in each of six age groups (15-19, 20-24, 25-29, 30-34, 35-39, and 40-44). (fertility rate). Values for this variable will be required for the base year and all other years except the last four years.
Card 20	V2	AGIRLS(I,J) I = age group J = year of simulation minus four	The number of females in each of the six age groups for the variable ABIRTH. This variable is calculated by the computer program DWELLING YIELD #3.
Card 21	V3	ADEATH(J) J = year of simulation minus four	The percentage of preschool deaths for the births estimated by V1 and V2. This variable is required for the base year and all other years except the last four years of the simulation.

PROGRAM NAME: Enrollment Prediction Simulation #6 (cont.)

Card 22	V4 APREMI(J) J = year of simulation	Net kindergarten migration each year of the simulation. This variable is calculated by the computer program DWELLING YIELD #2.
Card 23	V5 AMIGRA(I,J) I = grade level J = year of simulation.	For each year and grade level, except grade K (labeled level 1 in the simulation output), net migration to the public schools during the previous year and grade. If there is a net gain, the value will be positive, if there is a net loss, it will be negative. This variable is calculated by the computer program DWELLING YIELD #1.
Card 24	V6 APRIVS(J) J = year of simulation.	The number of potential kindergarten children who will enroll in non-public school instead of public school during each year of simulation.
Card 25	V7 ATRANS(I,J) I = grade level J = year of simulation.	For each year and grade of the simulation, net transfers to non-public schools during the previous year and grade. A loss in the public schools would be reflected by a negative net transfer and a gain reflected by a positive figure.
Card 26	V8 AHOLDS(I,J) I = grade in which students remain. J = year of simulation.	For each year of simulation, the percentage of students in each grade who are retained at the end of the previous year and will remain in that grade level for another year.

PROGRAM NAME: Enrollment Prediction Simulation #6 (cont.)

Card 27	V9	AINSTI(I,J) I = grade of simulation J = year of simulation	For each year and grade of simulation, the percentage of students who are dropped from the regular classroom roll, because of death, institutionalization, or movement to special classes or schools during the previous year and grade.
Card 28	V10	ADROPS(I,J) I = grade of dropout J = year of simulation	For each year of simulation, the percentage of students who dropped out of school from grades seven through eleven during the previous year.

Each of the above variables has three forms, all of which must be included in the data. The various forms are designated by the prefixes "A," "B," and "D." ABIRTH refers to the "high" estimate, BBIRTH to the "most likely," and CBIRTH, the "low" estimate. An optional form, DBIRTH, not used in this study, refers to the estimated percentage made for the variable in the calculation of enrollment by sex. Other variables follow the same pattern.

Data should be ordered so that all forms of the variable with the first subscript values are read, then the three forms with the second subscript values are read, and so on. When two subscripts are used, the first subscript is the first to vary, forming the inside loop.

GLOSSARY OF TERMS

Alternative Growth Patterns. Alternative ways land will be developed which take into account specific uses of land as they have been defined by differing public development policies. These may include existing zonings of governmental agencies, proposed general plans, or a combination of both. Alternative growth patterns, or land use alternatives, are conveyed as both a political development decision and, for purposes of mathematical analysis, a "number of acres available for development" value (i.e., land use alternative A = existing zoning...land use alternative A = "number of acres available for development" under existing zoning).

Base Year. The first year predicted, minus one. If, for example, the enrollment projection was being done for the years 1977 through 1993, the base year would be 1976.

BREAKDOWN sub-program. The sub-program of the Statistical Package for the Social Sciences (SPSS, 1970) used to calculate dwelling yield values from a 100% census (see page 17).

CLEANUP program. A computer program designed to prepare BREAKDOWN census data for use in the Enrollment Simulation Program. CLEANUP changes all alpha characters to blanks, removes all cases where the dwelling unit is vacant, identifies those cases where the family has moved into a new dwelling in the last two years, sums the number of children in each age level from 1-17, and places females in six groups according to age. Other data passed on by CLEANUP include the tract, area and block number, number of persons living in the dwelling, type of dwelling, race of occupant, age of dwelling, length of time lived at present address and total family income (see page 17).

Control Cards. The cards setting the parameters for a computer run and stating the desired output. Examples can be found in Section V, Descriptions of the Programs (see page 36-50).

Critical Development Factors. Those factors which are considered, by staff and citizens' land use committee, to be pivotal in determining the type and rate of growth in a study area. Critical development factors might include construction of flood control facilities, new roads that provide better access to a particular area, changes in zoning, installation of water treatment facilities and proposed subdevelopments (see page 8).

Data Collection Forms. Forms, shown in Appendix B, used for collection of data for all computer programs except SPSS/Cleanup.

Denham Model. A probabilistic school enrollment model using Monte Carlo computer simulation. The enrollment model was developed by Dr. Carolyn H. Denham, California State University, Long Beach.

Development Trends. The prevailing tendencies in residential construction which can be identified as a composite of one or more of the following factors: recent residential construction activity; proposed new developments; annexation or rezoning which imply development in the near term; and local government policies with a clear implication for development (either as stimulants or inhibitors of development). See page 7).

Dwelling Unit Type. Up to six categories of dwelling unit types may be used in land use study: (1) single family; (2) 2-4 units; (3) duplex; (4) 5+ units; (5) apartments; (6) mobile homes and townhouse/condominiums. In Morgan Hill land use study, two categories of dwelling types were used: (1) single family dwellings; and (2) multiple family dwellings.

Dwelling Unit Densities (DUD). The number of dwelling units permitted per acre under a specific zoning policy (see page 14).

Dwelling Yield Programs.

PROGRAM # THREE "Dwelling Yield #A": computer program designed to calculate net inmigration of students 1-12 (grades). See page 18.

PROGRAM # FOUR "Dwelling Yield #B": computer program designed to calculate net inmigration of students K (grade). See page 22.

PROGRAM # FIVE "Dwelling Yield #C": computer program designed to calculate total number of females aged 15-44 (see page 27).

Enrollment Worksheet. Worksheet provided in Appendix B for collecting past enrollment data in a district.

ENSIM Model. Enrollment simulation model comprised of six computer programs.

Fertility Rate. Number of live births per each 1,000 females between the ages of 15-44.

General Plan. A general policy statement reflecting desired future land use or development.

Growth Rate Estimates. Estimates made by citizens' committee and staff of the percentage of vacant land in a study area to develop. Estimates are based on subjective appraisals of the development factors that will affect a specific study area and on a general knowledge of the district's growth history (see page 9).

Inmigration Data. Calculated or estimated data concerning the number of people coming into an area at a given time. Inmigration data is needed for Step Six of the ENSIM Model (see page s 18 and 22).

Land Yield Program. Computer program #1 used to predict the number of future dwelling units to be constructed at a given time in a given study area (see page 7).

MFD. Multiple family dwellings.

Multi-Variable Projection Method. Method of projecting enrollments through analysis of many variables, both internal (within the district) and external (such as land use and legal-political-economic considerations), different from the traditional, short-term progressive method.

98% Confidence Interval. Three standard errors of the mean

$$98\% \text{ confidence} = 3 \times \frac{\text{standard deviation}}{\text{sample size}}$$

(see page 18).

"Number of Years" Variable. The number of years that the simulation run will project--can range from 1 to 15.

Primary Input. Unprocessed, raw data; four types are required for the ENSIM Model:

1) **Land use data**: data produced by the land use study which goes through intermediate steps before entering the Denham Model (see page 7).

2) **School district census data**: district census data which goes through some intermediate steps before entering the Denham Model (see page 17).

3) **School district enrollment data**: district enrollment data directly entering the Denham Prediction Model (see page 32).

4) **County Health Department data**: County Health Department data directly entering the Denham prediction model (see page 32).

Probabilistic Input. Inexact data, either calculated or estimated, which is within a high and low range 98% of the time.

SFD. Single family dwelling.

Simulation System. A "what if" method of simulating new situations by introducing new variables to established set of constants.

SPSS. Statistical Package for the Social Sciences (1970), Version 5.00 used for analysis 100% census conducted within the seven elementary districts of the East Side Union High School District in Santa Clara County, California (see page 17).

Study Area. An area within a school district where development will be influenced by a unique set of critical development factors and which contains certain physical characteristics that distinguish it in some way from its surroundings; 30 study areas maximum in the ENSIM program (see page 9).

Subpopulation. Those persons living in a specified dwelling type.

Yield Value. Average number of persons (1-12 students, K students, adult females) per dwelling type.

APPENDIX A

A CASE STUDY - MORGAN HILL UNIFIED SCHOOL DISTRICT

Morgan Hill Unified School District, located in the southern portion of Santa Clara County, has recently developed a long-range master plan for school facilities and program. An important aspect of this process was the assessment of future growth in the district, so that adequate facilities could be planned for students inmigrating into the district. To provide this growth information, a Land Use Subcommittee was formed, composed of member of the larger, Citizens Planning Committee. The subcommittee, in conjunction with staff from Project Simu School and the Planning Resources Office (PRO), a department of the Santa Clara County Office of Education, developed a procedure for projecting future development, and thus assessing future needs.

The method for development projection was an evolutionary process. At the time the effort was begun, there was no clear idea of the necessary steps, or even their order. Only the output of the study was stated in certain terms--an estimate of the number of new dwelling units that could be expected in the district five, ten, and fifteen years hence.

It should be pointed out that the reasons for developing this rather sophisticated procedure was that no reliable estimates of future growth in Morgan Hill were available. The Santa Clara County Planning Department, whose past growth estimates for the south county have been wide of the mark, did not feel that their current projections accurately reflected what the future held for the Morgan Hill area.

The technique the Planning Department has traditionally used for other, more urbanized regions of the county proved to be inappropriate for what is essentially a rural area. Furthermore, even those projections which were available had been done for incorporated cities and planning areas which did not correspond to school district boundaries. Indeed, they were not even close.

The case study that follows provides descriptions of both the successes, and shortcomings of the Morgan Hill land use study. While Morgan Hill Unified School District is, like all school districts, unique unto itself, it is hoped that the information outlined in the following pages will afford the reader some insight into the monumental task of predicting what the future holds.

DIVISION 1

DEMOGRAPHIC STUDY

1.1 Special Characteristics of the District

1.1.1 Unified in 1966, Morgan Hill Unified School District covers about 300 square miles of land area between the Santa Cruz and Stanislaus county lines. The northern boundary is Metcalf and Bernal Roads north of Coyote. The southern boundary is Church Avenue halfway between San Martin and Gilroy.

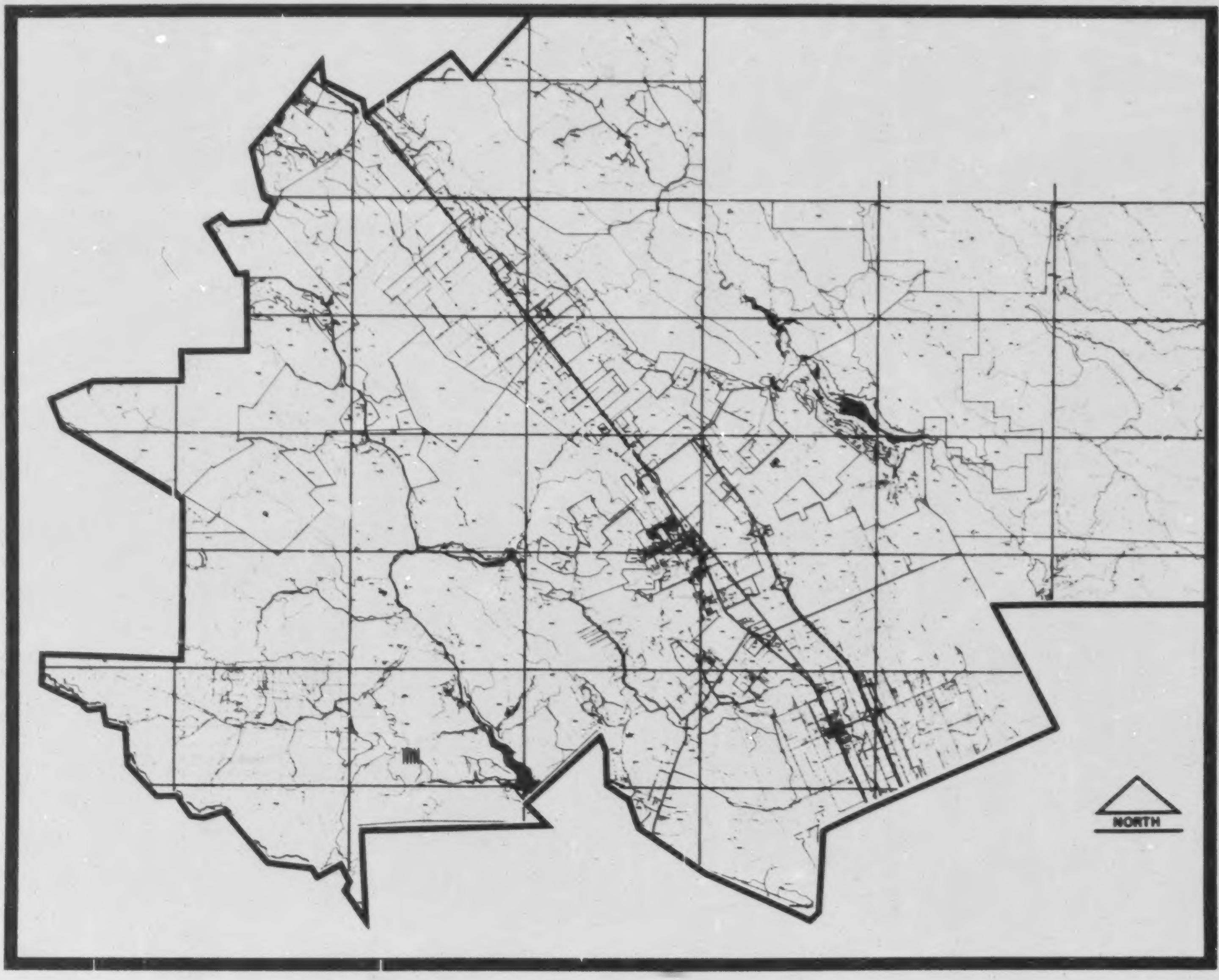
This area includes about ten square miles within the city limits of Morgan Hill and about 25 square miles which has already been annexed to the city of San Jose. The balance, approximately 265 square miles, lies in unincorporated portions of the County of Santa Clara. Half of the district is in San Jose's sphere of influence, with most of the remaining falling in that of Morgan Hill's. Though the district accounts for only 1.5% of the county's total population, it comprises 23% of the county's land area.

Although the major portion of the district lies within the jurisdiction of the county, its control over urbanization should not be assumed--first, because annexations frequently take place prior to the development of land; and second, because the county has adopted urban development policies which defer development proposals to the cities whose "sphere of influence" covers the area. One major exception exists, however. County land in the agricultural zones will allow residential lots of 2.5 acres. Since most of the county land in the district is so zoned, the land could fully develop in this manner with no control exerted by the cities.

Currently there is a great deal of "ranchette" development in the district, and its occurrence has already caused concern that the dominant land use will eventually be these two and one-half acre residential units.

The boundaries of Morgan Hill Unified School District are not coterminous with any other jurisdiction's limits. On the south, the boundary is close to, but not coincident with, the sphere of influence line between Morgan Hill and Gilroy (see Map 2). Since this line represents the mutually agreed line over which neither city will annex, there is good reason to make these boundaries coincide someday. A large portion of San Jose's area is in one ownership (Oceanic Properties) and is being considered by the San Jose City Council for approval of a 7,000± person community.

1.1.2 Land features and transportation routes have an important influence on both school administration and pupil conveniences. Map 3 illustrates these major environmental characteristics. The school district encompasses a long, flat valley, the narrowest point of which is approximately one mile and lies at its northern-most



Map No. 1

DETAILED BASE

▬ School District Boundary

MASTER PLAN STUDY 1974

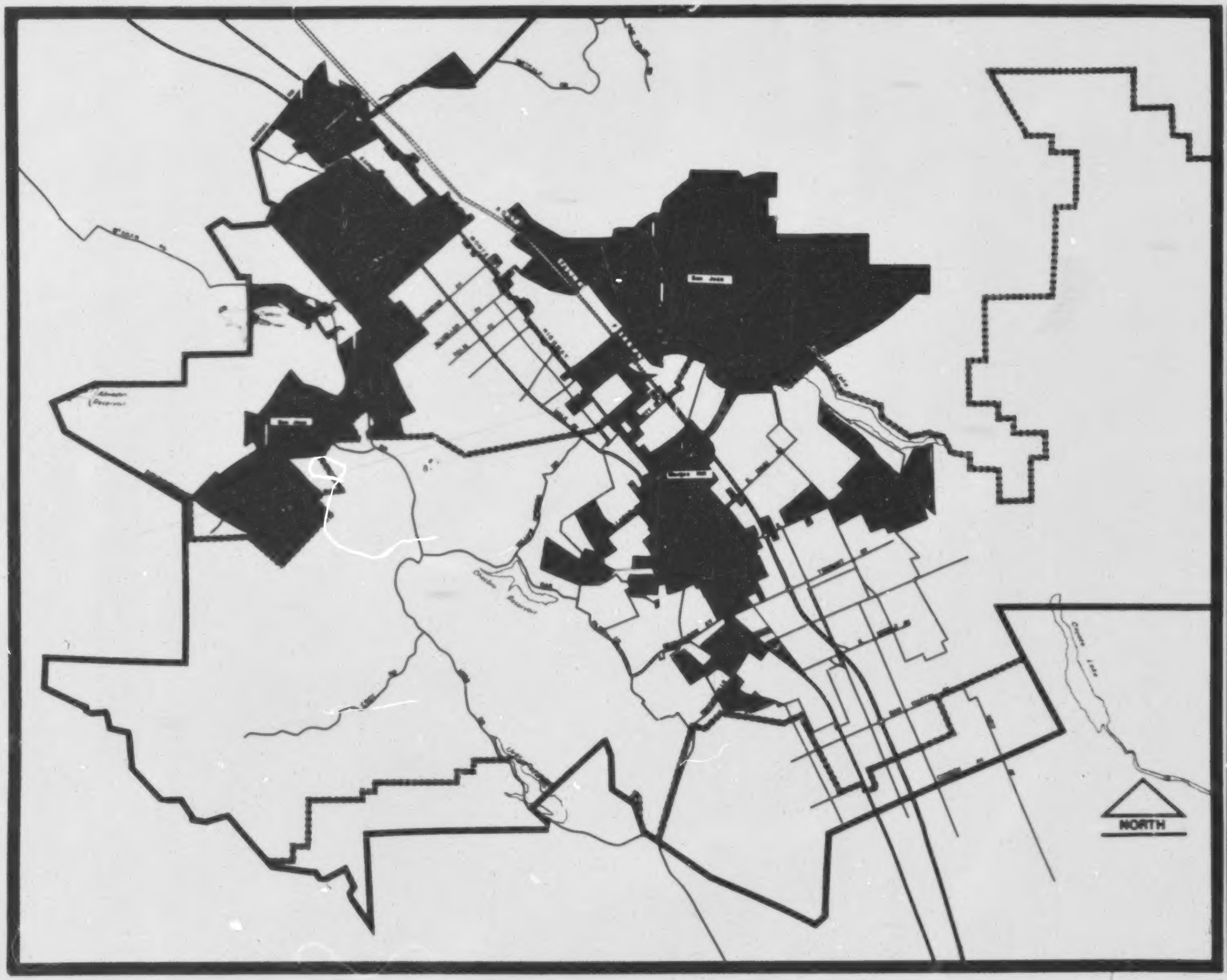
Morgan Hill Unified
School District

6a

b

Map No. 2

MAJOR POLITICAL JURISDICTIONS


San Jose
Morgan Hill
NORTH

- School District Boundary
- Sphere of Influence Boundary
- Urban Service Area Boundary
- Morgan Hill City Limits
- San Jose City Limits

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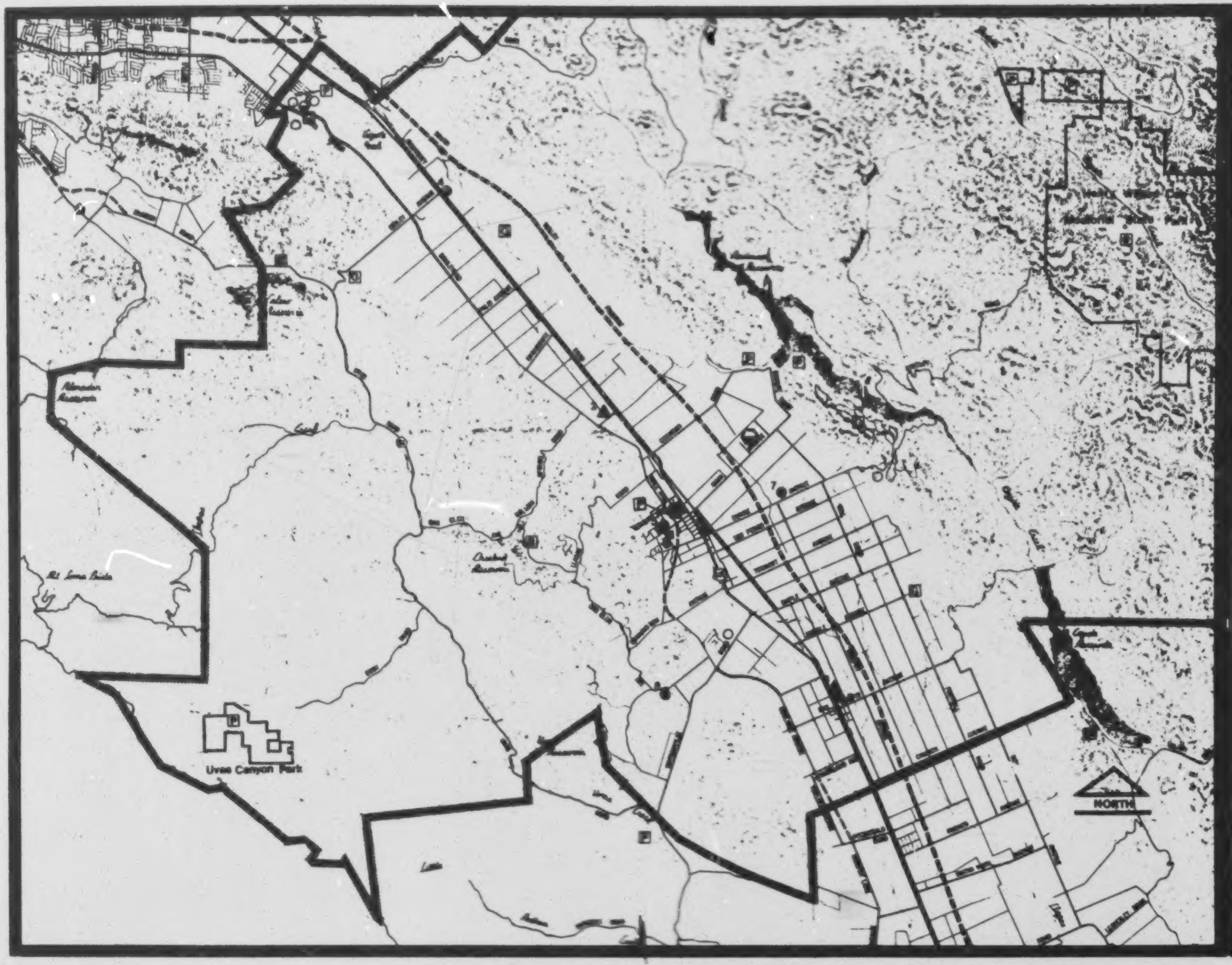
Morgan Hill Unified School District

Map No. 3

SCHOOLS, PHYSICAL FEATURES & RECREATION FACILITIES



SCHOOLS

- ⬢ HIGH SCHOOL
  - 1. Live Oak
- ▲ MIDDLE SCHOOL
  - 2. Burnett
  - 3. Gwinn
- ● ELEMENTARY SCHOOL
  - 4. Encinal
  - 5. Walsh
  - 6. Morgan Hill
  - 7. Nordstrom
  - 8. Machado
  - 9. San Martin
- ■ PRIVATE SCHOOL

SCHOOL SITES

RESERVED

- ⬡ High School
- ○ Elementary School

OWNED

- High School
- Elementary School

RECREATION FACILITIES

- ▣ GOLF COURSE
- ▣ PARK
- ▣ BOAT RAMP

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Morgan Hill Unified
School District

September 1973

extremity. The valley is bordered by foothills of the coastal range on the west and the Diablo range on the east. Lakes and creeks abound in these foothills and provide extensive recreational opportunities for district residents, as well as residents of the entire Bay Area. Some valleys in these foothills are level enough to support small clusters of homes.

The steepness and irregularity of the foothills prohibit any but infrequent narrow, winding roads. Virtually all traffic traversing the district in a north-south direction must use valley floor highways. A major expressway (Santa Teresa) is under construction along the west side of the valley, and a new freeway has just been completed along the middle of the valley, from mid-district to its southern extremity. The northerly extension of the freeway to San Jose and U.S. 101 is projected for 1980. A railroad line runs generally along the old Highway 101. The railroad line and Highway 101 gave rise to the major urbanization elements which have developed alongside.

With one exception, the district's schools are located on the valley floor, most of them in close proximity to Highway 101. Public recreation facilities are few and widely scattered.

1.1.3 The district's "city" is clearly Morgan Hill. As mentioned earlier, San Jose's city limits extend into the district's northern half, but the development there is predominantly suburban in character. Near the southern boundary of the district is the unincorporated community of San Martin, whose origins date back as early as those of Morgan Hill.

The entire valley was, in the late 1800's, entirely devoted to farming and grazing. Now urban uses are either scattered along the main traffic arteries, nestled near the two main communities, or clustered around an outlying resource point or an amenity highlight.

Although comprising only 1% of the county's total land area, the city of Morgan Hill contains the largest amount of land currently devoted to urban uses (see Table I-A). San Jose's portion, although eight times the size of Morgan Hill, is far behind in urban uses.

As seen on Map 4, Existing Land Use, there are three large concentrations of residential uses: south of Bernal Road in Los Paseos; central Morgan Hill; and adjacent to Anderson Lake (Jackson Oaks-Holiday Lakes). There are, however, smaller concentrations scattered throughout the valley that can be expected to grow in number and size. Especially significant is the agricultural and residential category where the so-called "ranchette" development is occurring. Most of this development occurs east of Monterey Highway, with large amounts beginning to encroach upon the agricultural area in San Martin.

Despite relatively rapid growth in the past several years, the great majority of the district retains a rural atmosphere. What will happen to this tranquil setting? Perhaps an initial answer can be seen in the zoning regulations currently held by the district's three primary governing bodies. Table 1-B summarizes the population growth that could result were development to occur according to current zoning.

TABLE I-A

Morgan Hill Unified School District
Existing Land Use Acreages (1972)

Land Use Category	Acres			
	City of Morgan Hill	City of San Jose	Santa Clara County (unincorporated)	Total
Low Density Residential	865	125	1,160	2,150
Medium Density Residential	20	20	5	45
Commercial	50	0	25	75
Industrial	105	5	190	300
Vacant Urban	490	45	335	870
Public Buildings	95	0	20	115
Parks and Open Space	214	11	12,570	12,795
Agriculture	1,190	2,720	7,990	11,900
Non-Urban Open Space (Lakes and Reservoirs)	5	320	695	1,020
Forest and Brush	1,650	11,900	149,780	163,330

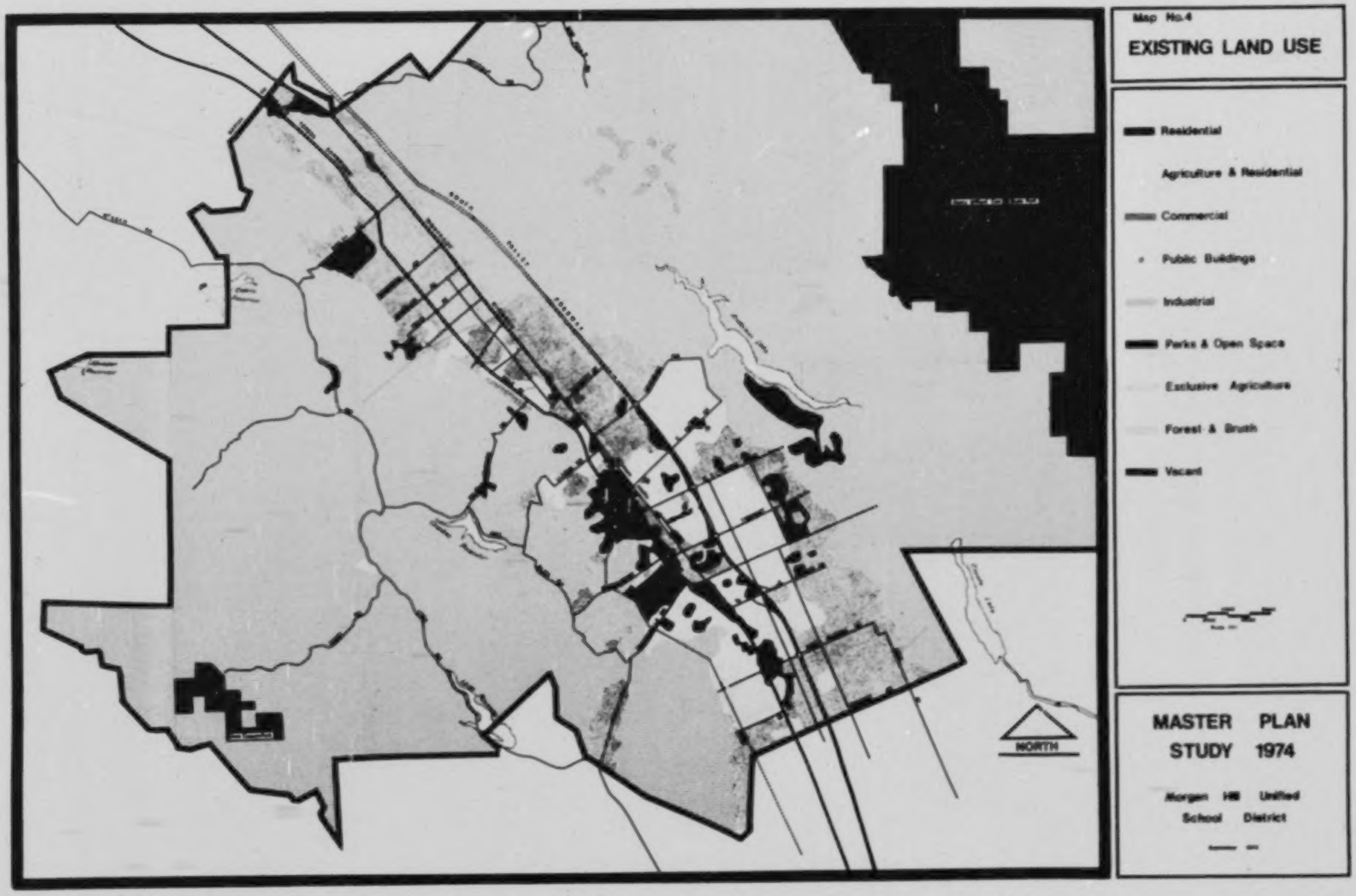
Map No.4
EXISTING LAND USE
Residential
Agriculture & Residential
Commercial
Public Buildings
Industrial
Parks & Open Space
Exclusive Agriculture
Forest & Brush
Vacant
NORTH
MASTER PLAN
STUDY 1974
Morgan Hill Unified
School District

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TABLE I-B

Morgan Hill Unified School District
Zoning Acreages and Population Capacity of Zoning

Jurisdiction	Zoning Category	Gross Acres	Net Density (Dwelling units/acre)[1]	Population		
City of Morgan Hill	R-1	2,362	5	32,130		
	R-2	1.7	10	45		
	R-3	483	16	19,000		
	R-4	66	16	2,500		
	R-E	338	1	860		
	RPC	590	1.45	2,175		
	PUD	243	5	1,600		
					Total	58,310
City of San Jose	R-1	17,436	2	96,960		
	R-3-B, R-3-C	21	10	500		
					Total	97,460
Santa Clara County (unincorporated)	R-1	30	8	650		
	Mul/low den.	2[2]	10	50		
	resid/agric.	65,000[2]	.4/.1[3]	21,750[4]		
					Total	25,650
			School District Total			181,420

1 - Net density in dwelling units per acre.

2 - 17,500 acres is of less than 10% slope, remainder greater than 10% slope.

3 - Density on land less than 10% slope: 0.4; on land greater than 10% slope: 0.1 (average).

4 - Population calculated on 17,500 acres of less than 10% slope and on 10,000 acres of land greater than 10% slope.

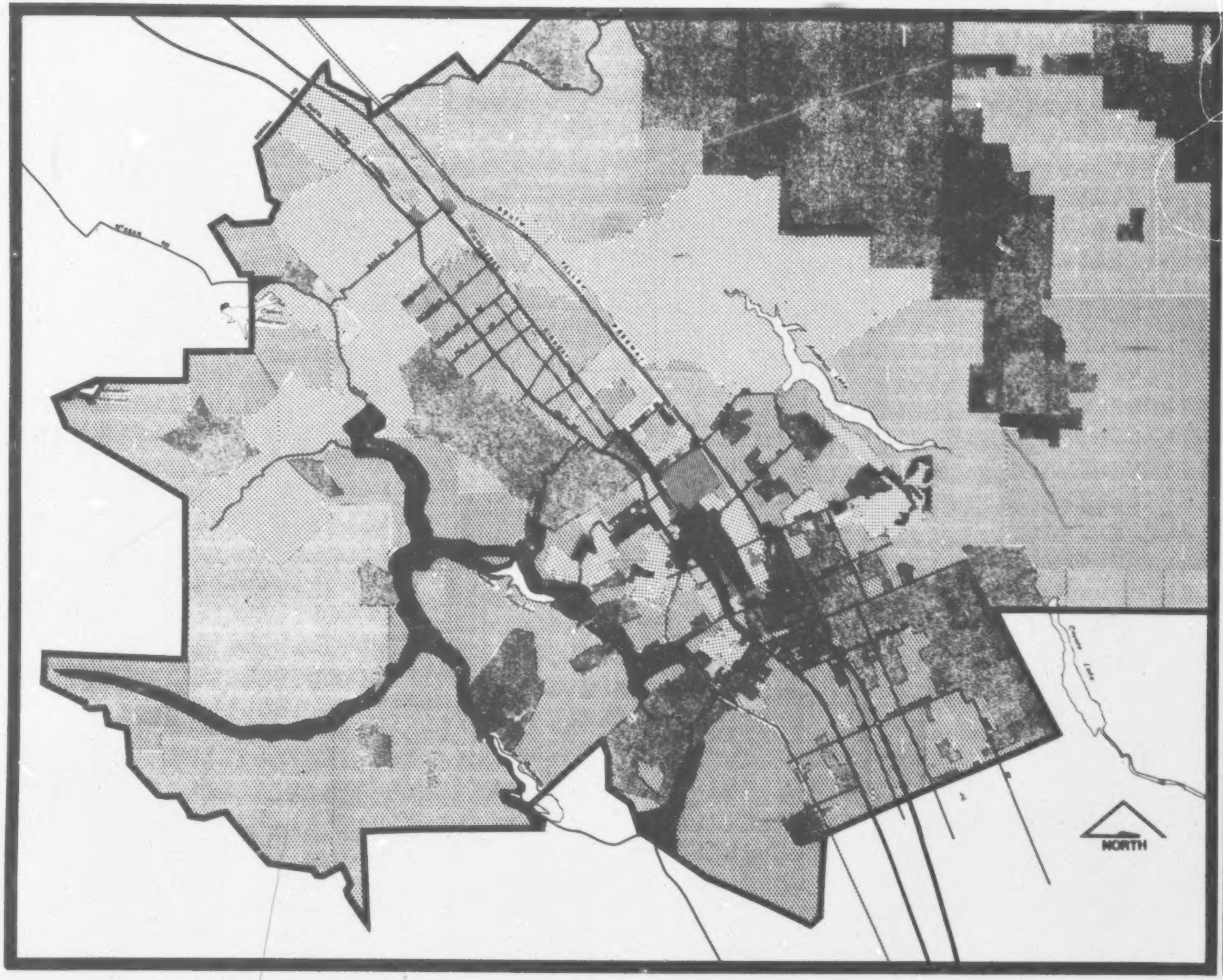
The total population for all zones would be over 180,000, with the largest number residing in San Jose (97,460). Table 1-A shows the major portions of urbanization shifting from the southern to the northern part of Morgan Hill Unified School District.

Map 5, zoning composite, shows, however, that the district's pattern of development is still one of wide dispersion. Approximately 20,000 acres of land are zoned R-1, with another 65,000 acres zoned for an even lower residential density. On the other hand, only 582 acres are zoned for high residential density. In San Jose's sphere of influence, two very large pieces of land zoned R-1 flank the main traffic arteries (Monterey Highway and the South Valley Freeway) on the east and west. If these areas are developed, the district will face a large increase of school age children. (A proposal to develop the segment near Lake Anderson was before the San Jose Planning Commission early in 1974 but was recently withdrawn; the developer has indicated that he intends to resubmit the proposal at a later date.) What's more, the district may have to contend with a racially imbalanced population in those areas where massive busing is required to achieve integration.

In Morgan Hill's sphere of influence, the development pattern, as indicated by zoning policy, would have a somewhat more compact configuration. However, as indicated by the urban service area and the population capacity of zoning (Table 1-B), this is a rather ambitious plan which skips over large areas of vacant land and develops areas far from the center city.

Perhaps more significant is the zoning category, "agriculture and residential," which, although appearing under the heading, Open Space, would allow residential development at a density of one dwelling unit per 2½ acres. As mentioned above, this is the area of ranchette development in which homes are built on 2½ acres with wells and septic tanks. The trend toward this type of development is up markedly, and should it continue for a few more years, it will become irreversible. As a consequence, the land will be too cut up to support large-scale agriculture or major subdivisions. If the land's sole use becomes ranchette development, the school district will forever be committed to busing a majority of its student population.

In the future, the citizens of the ranchette areas will be anxious to find solutions to problems of health, transportation and safety. They will, however, be trapped with too low a tax base to resolve these problems. There is a compensating factor in this trend. Ranchettes are appearing in areas of low income and minority families concentration, thus providing a more balanced socio-economic/ethnic mix in the schools. The ranchette development pattern eliminates the neighborhood school as a viable concept, with the consequence that residents do not have the antipathy toward "busing" found in many other areas.



Map No. 5

ZONING COMPOSITE

RESIDENTIAL
- Low Density
- Medium Density
- High Density

COMMERCIAL
- Central Business District
- Neighborhood Shopping
- Professional

INDUSTRIAL
- Light
- Heavy

OPEN SPACE
- Agricultural & Residential
- Exclusive Agriculture
- Open Space & Scenic Services

CIRCULATION
- Freeway
- Interchange
- Grade Separation
- Expressway & Major Thoroughfare
- Secondary Thoroughfare

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Though further in the future, a more realistic view of the district's eventual urban pattern is that which is shown on Map 6, general plan composite and tabulated on Table I-C. Here a total population of over 325,000 is possible with the major portion appearing in San Jose's sphere of influence (256,340). Because it is assumed that all land will be annexed to the city in whose sphere of influence it lies, the county estimate has been eliminated.

Within San Jose's sphere of influence, low density residential development would occur in the Los Paseos area, north of Bailey Avenue along the proposed South Valley Freeway and between Live Oak and Burnett Avenues. (This area will probably be fully developed by the end of 1974.) Medium density is indicated for small pockets around Lake Anderson. This latter development corresponds with the Oceanic Properties proposal for Lake Anderson which also includes some commercial and hillside development within the company's holdings around the lake. However, the general plan composite for San Jose's sphere of influence can be quite misleading since it contains many "holes" where no plans have been drawn. These "holes" occur in unincorporated areas, and in some cases, in areas that have already been annexed to San Jose. No plan has yet been prepared for these areas because all land south of San Jose's urban service area (see Map 2) is within the ten-year urban reserve as defined by San Jose's Urban Development Policy. These urban reserve lands are to be free of development for ten years, with a yearly policy review which could change their status. As a consequence, the county's general plan was used to fill in the "holes" in San Jose's plan. As the map indicates, the county's plan calls for large areas south of Bailey Avenue to remain unurbanized. This rather ambitious scheme for recreation and open space development could change drastically if San Jose reverses its Urban Development Policy, annexes in the area, and prepares its own general plan for the region.

Within its own sphere of influence, Morgan Hill's general plan would confine intensive land uses in the commercial, industrial and residential categories to the level areas of the valley floor. Industrial uses are called for along the Southern Pacific Railroad from Burnett Avenue in the north to Church Avenue in the south, and are confined to the area between the South Valley Freeway and Monterey Highway, except for a small portion between Monterey and Santa Teresa Expressway near Burnett. Commercial uses are spotted around the area, notably around freeway interchanges and within the business district of central Morgan Hill. A gradient of densities is prescribed for residential uses, with medium density along the freeway and Monterey Highway and, moving toward the hills on the east and west, low density and then hillside development. Large areas in Hayes Valley and west of Uvas Reservoir are reserved as watershed areas. A system of linear open space along the creekside, augmented by larger pieces of parkland, rounds out the plan.

1.1.4 In 1966, the population of Morgan Hill Unified School District was 11,613. In 1970, it was 15,410; and by the end of 1973, it had increased to 19,843. The increase between 1966 and 1970 represents an average annual growth rate of 7.3%, while the rate between 1970 and 1973 was 7.4%.

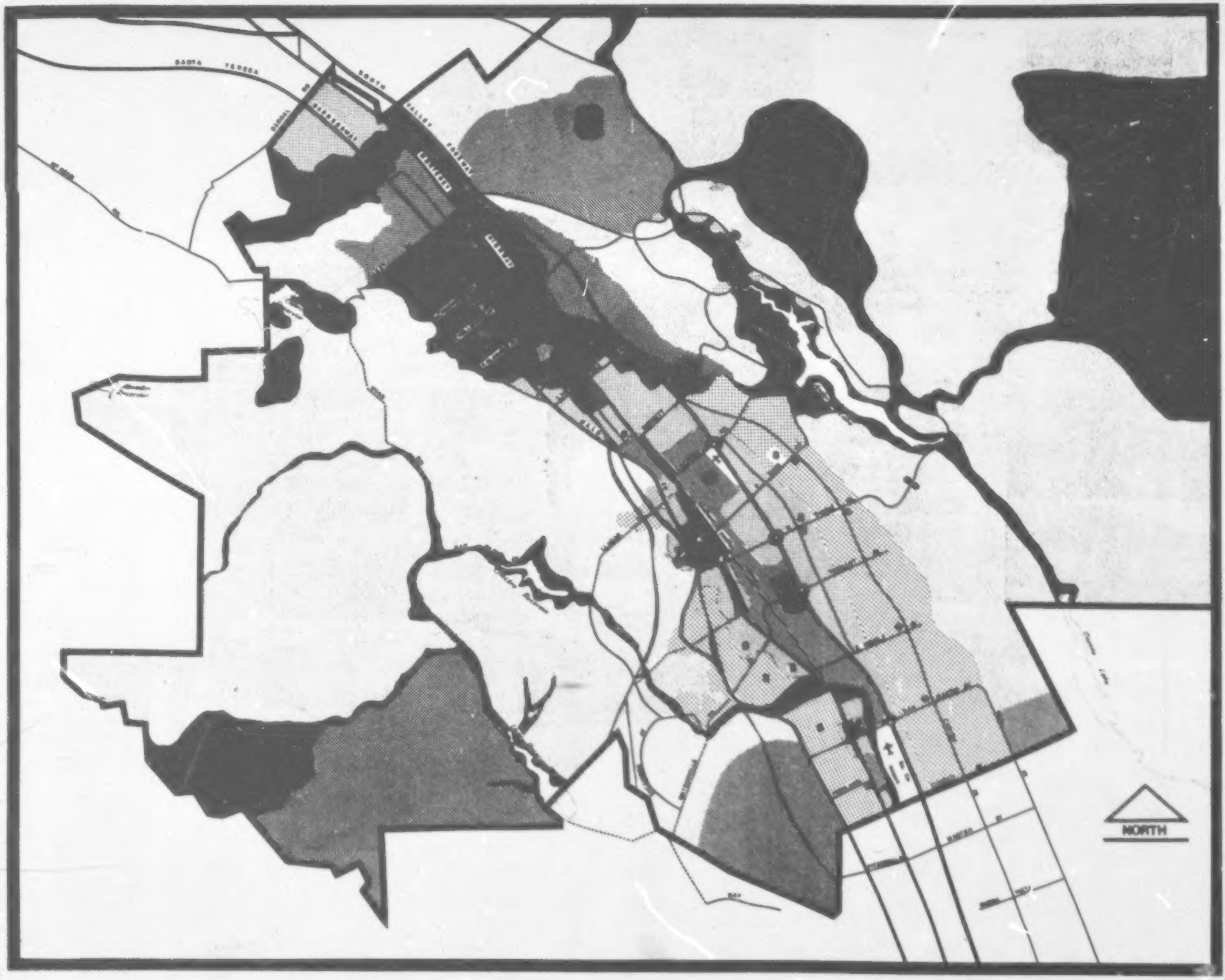
TABLE I-C

Morgan Hill Unified School District
General Plan Acreages and Population Capacity of General Plan

Jurisdiction	General Plan Category	Gross Acres	Net Density (Dwelling units/acre)	Population		
San Jose Sphere of Influence	Hillside/open space*	5,610	0.4	6,295		
	Hillside/open space**	57,890	0.15	17,190		
	Low Density*	680	7	12,185		
	Low Density**	280	2	1,435		
	Medium Density*	825	16	31,680		
					Total	68,785
Morgan Hill Sphere of Influence	Hillside/open space*	6,405	2	42,275		
	Hillside/open space**	27,472	5	45,330		
	Low Density*	5,896	5	94,335		
	Medium Density**	2,480	10	74,400		
					Total	256,340
			School District Total			325,125

* - Less than approximately 10% slope.

** - Greater than approximately 10% slope.


SANTA TERESA
SOUTH VALLEY FREEWAY
NORTH

Map No. 6

GENERAL PLAN COMPOSITE

RESIDENTIAL
Hillside & Open Space
Low Density
Medium Density
COMMERCIAL
Central Business District
Neighborhood Shopping
Professional
INDUSTRIAL
Light
Heavy
COMMUNITY FACILITIES
Schools
Governmental
RECREATION & OPEN SPACE
Creekside, Trails, Parks
Watershed
CIRCULATION
Freeway
Interchange
Grade Separation
Expressway and Major Thoroughfare
Secondary Thoroughfare
Parkway

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School District

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As mentioned earlier, the district's major population concentration liesin the area south of Bernal Road in Los Paseos, central Morgan Hill and the Jackson Oaks-Holiday Lakes developments. Scattered development, most of which is of very low density, occurs throughout the district with a significant amount around San Martin.

1.1.4.1 Tables I-D, I-E, I-F, I-G, and I-H describe some important population characteristics. The first table indicates that the district has a larger minority population percentage than either the county as a whole or the two comparison cities. Table I-E shows that a much higher proportion of the district's families falls into the two lowest income categories than do either of the comparison jurisdictions.

Comparing the data in Table I-F with the countywide statistics compiled in Profile '70 shows that the district contains the same percentage of children under five as the county average (9.2%), and that it contains slightly more in the 5 to 17 year old range (29.4% for Morgan Hill Unified School District and 27.4% for the county).

As shown in Table I-G, the district exhibits a significantly different pattern in housing value and contract rent than does the county as a whole. Countywide, 3.6% of the owner-occupied units are valued under $15,000, while in Morgan Hill Unified, 9.0% are valued under $15,000. In the over-$35,000 category, the percentages are 23.0% for the county and 24.3% for the district. In contract rents, the differences are even more marked. For Santa Clara County as a whole, 15.9% have rents less than $100, while in Morgan Hill Unified, 43.9% have rents less than $100. In the over-$200 category, the percentages are 12.8% for the county and only 4.8% for the district.

TABLE I-D

Morgan Hill Unified School District, 1970
Racial Composition and Comparison with Other Jurisdictions

	Spanish-American	Negro	Other Races	Total Non-White	Total Minority
County Average	17.5%	1.7%	4.0%	5.7%	23.2%
Morgan Hill U.S.D.	29.7%	0.3%	6.0%	6.3%	36.0%
Milpitas	16.6%	4.6%	5.1%	9.7%	26.3%
San Jose	23.8%	1.7%	4.0%	5.7%	29.5%

TABLE I-E

Morgan Hill Unified School District, 1970
Family Income and Comparison with Other Jurisdictions

	Under $5,000	$5,000-6,999	$7,000-9,999	$10,000-14,999	$15,000-24,999	$25,000-49,999	$50,000 or more
County Average	10.8%	7.5%	15.8%	30.9%	27.7%	6.4%	0.8%
Morgan Hill U.S.D.	18.9%	10.3%	17.2%	26.5%	21.9%	4.8%	0.4%
Milpitas	9.7%	7.0%	19.2%	29.9%	22.5%	1.4%	0.3%
San Jose	11.5%	7.9%	16.7%	33.7%	25.7%	4.1%	0.4%

TABLE I-F

Morgan Hill Unified School District, 1970
Age Distribution of Families

Type of Family and Number of Own Children:

Total Families	3,743
Families with own children under 18 years	2,429
Number of children under 18 years	6,074
Children per family (per total families)	1.6

Age Distribution of Children Belonging to a Family:

	Under 3 yrs.	3-4 yrs.	5-9 yrs.	10-14 yrs.	15-17 yrs.
Male	424 (2.7%)*	324 (2.1%)*	911 (5.8%)*	950 (6.0%)*	517 (3.3%)*
Female	380 (2.4%)*	320 (2.0%)*	880 (5.6%)*	861 (5.5%)*	506 (3.2%)*
Total	804 (5.1%)*	644 (4.1%)*	1,791 (11.4%)*	1,811 (11.5%)*	1,023 (6.5%)*

* Percent of total population

TABLE I-G

Morgan Hill Unified School District, 1970
Housing Value and Contract Rent

Value of Owner-Occupied Housing	Percent of Total	Contract Rent	Percent of Total
Less than $5,000	0.6	Less than $39	5.6
$5,000 - $9,999	2.6	$40 - $79	22.6
$10,000 - $14,999	5.8	$80 - $99	15.7
$15,000 - $19,999	13.6	$100 - $149	34.1
$20,000 - $24,999	21.9	$150 - $199	8.7
$25,000 - $34,999	31.2	$200 - $249	3.2
$35,000 or more	24.3	$250 or more	1.6
		No cash rent	8.5
	100.0		100.0

TABLE I-H

Morgan Hill Unified School District, 1970
Rooms Per Occupied Housing Unit

No. of Rooms	% of Total
1-2	7.0
3	12.8
4	6.9
5	31.9
6	23.1
7	11.0
8	4.8
9 or more	2.5
	100.0

1.2 Methodology for Analysis and Forecasting Future Needs

Figure 1 depicts the land use analysis procedure used to estimate future development and school enrollment. The analysis procedure was used to make assumptions about the future, about the development policies of local governments, and about the development potential of the district. These assumptions serve as guiding predictions of what the future state of the district will be. They serve as a framework that allows the district to periodically reassess its assumptions in light of actual performance and changes in public land use policy.

1.2.1 Growth Rates, Trends and Development Potential

Growth rates and trend analysis are common methods of projecting urban growth and change. In the Morgan Hill study, however, their application was considered limited; first, because of the area's small amount of existing development; and second, because of the magnitude of a number of factors capable of causing major changes in development pattern and rate. However, growth rates and trends were documented for use in comparing projections based on other factors.

The first data under analysis was the district's growth history, summarized earlier in section 1.1.4.1.

Large-scale maps of the school district were provided by the PRO and together with staff, the Subcommittee entered on these maps all the known information that was pertinent to development. This included such things as recent and current development activity, zoning changes, vacant parcels of land that were being considered for development or which had development potential because of some local amenity or proximity to essential services and areas where problems of engineering, politics or finance might inhibit or delay development.

In this connection, the PRO consulted with the San Jose City Planning Department regarding development activity in the district and clarified San Jose's Urban Development Policy, its implications for the district, and possible changes in this policy in the future. An attempt was made to meet with Morgan Hill's planner, but because he was without an office while being moved into new quarters, he could not be reached. The Santa Clara County Flood Control and Water District was contacted concerning flood control work in the district, expansion of an existing reservoir and a proposal for a new reservoir.

The planner coordinating the South County Planning Program in the Santa Clara County Planning Department was consulted and contact was continued over a long period of time. Extensive use was made of data and graphic material that the South County Planning Program had developed.

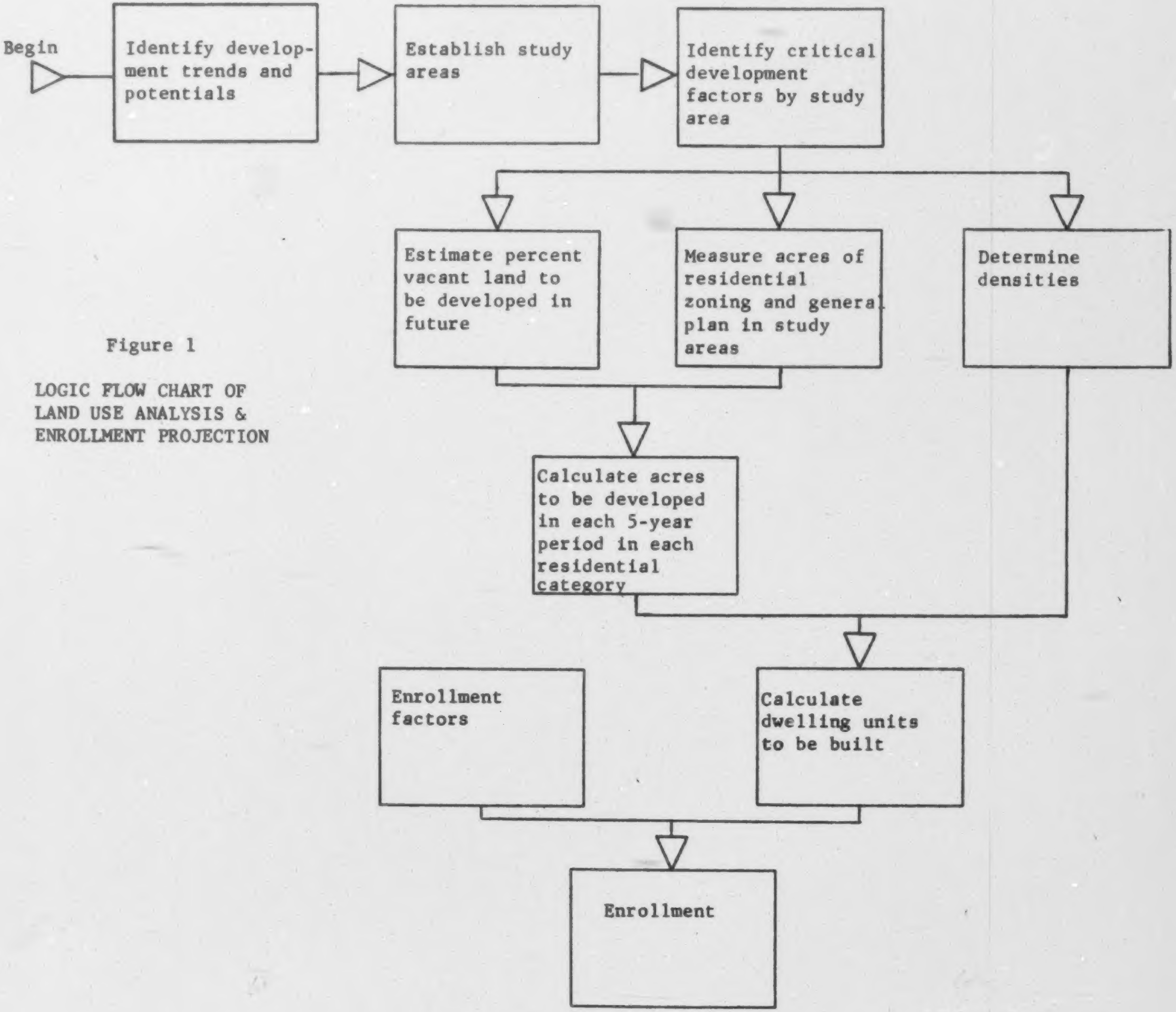

Begin
Identify development trends and potentials
Establish study areas
Identify critical development factors by study area
Estimate percent vacant land to be developed in future
Measure acres of residential zoning and general plan in study areas
Determine densities
Calculate acres to be developed in each 5-year period in each residential category
Enrollment factors
Calculate dwelling units to be built
Enrollment

Figure 1

LOGIC FLOW CHART OF
LAND USE ANALYSIS &
ENROLLMENT PROJECTION

In addition, several reports were reviewed which were relevant to development in the district. These included Environmental Impact Reports, a proposal for new waste treatment facilities, and general plans.

It would be appropriate to consult every government agency or large private concern which could be undertaking work in or near a district and all governmental bodies whose jurisdiction falls within or near a district and whose function might affect development. Other examples of these sources, which were not relevant for MHUSD would be a regional parks district, mass transit district, or bridge authority.

Also at this time, the PRO staff began developing several maps showing the land use, zoning, and general plan policy for the district. This effort consumed several months and the information gathered on the maps was utilized in later steps of the process.

Out of all of the data gathered, thirteen critical development factors were identified. One factor judged to be critical, for example, was a proposal for a 5,000-unit development which was currently before the Planning Commission. An environmental impact report, contact with the developer, and information from the Planning Department having jurisdiction was the data gathered concerning this factor. Obviously, a development of this size would be watched carefully and would have a tremendous direct impact on growth, as well as stimulating further growth because of the available services necessarily installed for the project. Somewhat more obscure than this, but nevertheless very critical to growth, was the possibility that the minimum lot size required for construction on unincorporated land might be raised from 2.5 acres to 5 or even 10 acres. This factor was important to MHUSD for two reasons. First, most of the district is presently unincorporated. Second, construction of large custom homes in unincorporated areas was rather considerable and on the rise. Since the scattered growth that results from this type of development presents the district with the problem of not only more school children but children widely scattered that need to be transported by school bus, this factor was deemed "critical." In similar fashion, eleven other critical development factors were identified.

1.2.2 Establishment of Study Areas

The district comprises 300 square miles and a great variety of land use and topographic features. In order to analyze and project the district's future development, it was felt that the district should be divided into smaller, more manageable units of land. Another factor that led to this conclusion was that the data gathered in Step I indicated that most factors that were critical to development were localized in their impact and did not affect the entire district. Therefore, it was assumed that the district could be divided into smaller areas which were relatively homogenous in regard to their development potential. Development within these areas would be subject to the same forces and would take place at approximately the same time. Where the area defined in this manner was still too large, it was divided into smaller pieces that were manageable for analysis. The boundaries for these areas were chosen so that they could be easily identified by someone "on the ground" who, for example, might be conducting a survey or census of the area. The result was the establishment of 29 "study areas" ranging in size from 725 acres to 46,600 acres (this latter area comprising a remote and mountainous area where little or no development is expected).

An added benefit that resulted from this approach was that by projecting development by study area, changes in these localized development factors which altered the projection in one or a few study areas would not invalidate the entire projection effort. Updating the projections in these few study areas would not be as difficult as redoing the projections for the entire district, with the end result that the process will be more flexible and adaptable to changing conditions.

As mentioned earlier, one of the study areas was 46,600 acres. In fact, two were of that size. Indeed, they contained little more than rugged hills, scant roads, few amenities to attract significant development, and, as a result, were all but ignored in the analysis. In fact, the reason the areas were equal in size was that the maps used to measure acreage included only the urbanized areas of Santa Clara Valley and near surroundings. The school district goes far beyond this into the Diablo Range to the east so its entire extent was not measurable on this map. But the acreage of the district was known from other sources and from this was subtracted the total of the remaining study areas to give the size of the two areas together, and this was merely divided in half. Since the areas are not very important for the present (or at least their size is not important), this approximation could be made.

Going further into the setting of the boundary for these two areas will provide an insight into the problems encountered elsewhere in the report, in addition to explaining why it was necessary to divide one unimportant area into two unimportant areas. The boundary was set coterminus with the sphere of influence between Morgan Hill and San Jose. The sphere of influence marks the area within which each city is allowed to annex and might be regarded as the possible future boundaries of each city. Since different cities have differing policies on land development, projections of future development must consider this as another important development factor. In fact, this became an implicit "development factor" and resulted in the grouping of study areas into two groups. One was called "San Jose Sphere of Influence," the other "Morgan Hill Sphere of Influence." The sphere of influence then became the overriding consideration in those areas through which it passed.

Other study area boundaries were set, for example, at the ridge line of a range of hills dividing two flatter areas, down the middle of a freeway (which is nearly always a barrier to development or a boundary between different types of development), and in several cases coterminus with a pipeline or transmission line. The pipeline became a compromise between two factors. First, the desire to set it at the point where development was expected to stop in the near term where the flat land becomes steeper, but which is hard to define and locate. And second, the necessity to set it where it can be easily located and described. There was, unfortunately, no identifiable landmark or even political boundary that was closer than the pipeline and in view of the possibility that the school district would perform a special census it was deemed advisable that the boundary be set as clearly as possible. The pipeline was judged to be close enough and it sure simplified map work!

A final word about setting study area boundaries: it was viewed as important to ensure that a study area be of manageable size and especially that the development factors be as uniform as possible over the entire study area. This latter means that it would be difficult to predict a single rate of growth for an area if two or more factors were at work over different parts of the area which might indicate differing development possibilities. Unavoidably, several conflicting factors may pertain to the same area and in this case, the possibilities need to be sorted out as different possible rates. This in fact was a common occurrence and is dealt with further along in the process. If the same policy affects more than one study area, even if they are adjacent, they can be more easily aggregated than they could be further divided later, so it is best to err on the side of over-division.

Once the 29 study areas were established, new housing units occupied since 1970 were tabulated by study area (see Table I-J). It was determined that the greatest growth has occurred in Study Area 1, or the Los Paseos area. Because either final or tentative subdivision maps have been submitted which account for all of the land suitable for development in the Los Paseos area, this growth will continue for the next several years.

Study Area 21, or the San Martin area, has experienced the second highest rate of growth. However, unlike the new construction in Los Paseos which occurred on a large scale and totals hundreds of units, new construction in San Martin is primarily of the custom home or ranchette type and has occurred in a few units at a time. In Study Area 27, or the Jackson-Holiday area, growth was slightly less than that of San Martin but fell somewhere between Los Paseos and San Martin in terms of type. While homes built in this area are qualitatively similar to those built in San Martin, they are part of a larger development which has a unifying plan.

Two other areas--Study Area 23, or central Morgan Hill, and Study Area 19, or the Watsonville-Sunnyside area--have also experienced considerable growth. The areas experienced identical growth in single family housing and were the only two study areas where new multiple family construction took place. In central Morgan Hill, 175 new multiple units were built, and in the Watsonville-Sunnyside area, 25 units were built. Multiple family construction was concentrated in these areas because both were within the Morgan Hill city limits and thus appropriately zoned.

Other study areas exhibited scattered growth of the ranchette type. This construction can be expected to continue in unincorporated territory unless resource shortages or increased minimum lot size make ranchette construction economically unfeasible.

TABLE I-J
Morgan Hill Unified School District
DWELLING UNITS (DU) OCCUPIED BETWEEN 1970 AND 1973 BY STUDY AREA

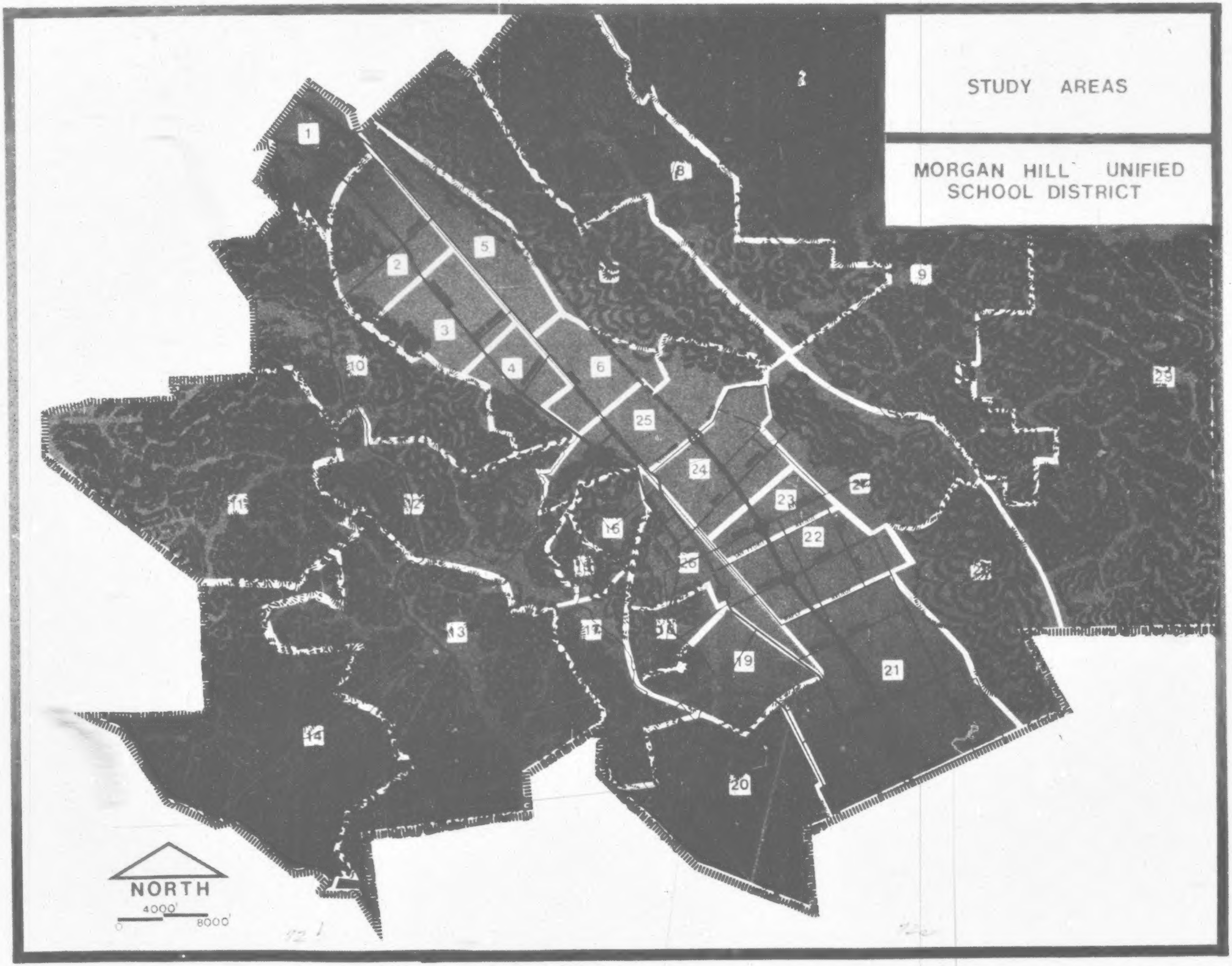
Study Area	Single Family DU Occupied 2nd Quarter '70 to 2nd Quarter '73	Growth Rate DU/Yr	Increase in Single Family Population 1970 - 1973[1]	Multiple Family DU Constructed 2nd Quarter '70 to 2nd Quarter '73	Growth Rate Mul. DU/Yr	Increase in Multiple Family Population 1970 - 1973[2]	Total Increase in Population 1970 - 1973
1	512	170.7	1792		0	0	1792
2	0	0	0		0	0	0
3	0	0	0		0	0	0
4	1	0.3	3		0	0	3
5	0	0	0		0	0	0
6	0	0	0		0	0	0
7	0	0	0		0	0	0
8	0	0	0		0	0	0
9	0	0	0		0	0	0
10	0	0	0		0	0	0
11	0	0	0		0	0	0
12	1	0.3	3		0	0	3
13	0	0	0		0	0	0
14	0	0	0		0	0	0
15	9	3	32		0	0	32
16	20	6.7	70		0	0	70
17	17	5.7	60		0	0	60
18	5	1.7	17		0	0	17
19	55	18.3	192	25	25	75	267
20	4	1.3	14		0	0	14
21	139	46.3	485		0	0	485
22	28	9.3	98		0	0	98
23	55	18.3	192		0	0	192
24	4	1.3	14		0	0	14
25	4	1.3	14		0	0	14
26	31	10.3	108	171	171	513	621
27	129	43	452		0	0	452
28	0	0	0		0	0	0
29	0	0	0		0	0	0
Total	1014		3546	196		588	4134

[1] 3.5 persons per DU

[2] 3.0 persons per DU

STUDY AREAS

MORGAN HILL UNIFIED SCHOOL DISTRICT


1
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16
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20
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22
23
24
25
26
29
NORTH
0
4000'
8000'

1.2.3 Critical Development Factors

Those factors which are considered pivotal in determining type and rate of growth and which were identified in 1.2.1 and used in 1.2.2 to establish the 29 study areas, were researched and analyzed in great detail. Information gathered from effected government agencies was used to assess the possible influence that each factor might exert. The results of this research are summarized below. In addition, the factors were cataloged according to the study area or areas they were expected to affect. This tabulation appears in Table I-K.

1. Oceanic Properties Developments

The approval or disapproval of the Oceanic Properties proposals at Lake Anderson and the Riverside Golf Course is considered the most critical development issue in the San Jose sphere of influence. If the proposals are approved, a pumping station and sewage trunk line (terminating approximately at Sycamore Avenue and the Monterey Highway) will be constructed. The existence of sewage treatment services will allow development from Coyote south in the San Jose sphere of influence at a much higher density than could occur with septic tanks.

2. Fisher Creek Improvement

A large area south of Tulare Hill and on either side of Bailey Avenue is subject to flooding and therefore impossible to develop. Currently the Santa Clara County Flood Control and Water District is developing a bond proposal for flood control work in the east zone of the district. Among the 18 projects being considered is one for improvements on Fisher Creek which would alleviate the flood problems in the area described above. Completion of this project would make more intensive development possible, other services being available. The draft environmental impact report has been prepared and is being reviewed by effected government agencies and other interested parties. Public hearings on the projects will probably be held in February, 1974, and if the bonds are passed, the projects should be completed in about 15 years.

3. South Valley Freeway Completion

The segment of the South Valley Freeway from south San Jose to Cochran Road is scheduled for completion in 1980. Completion of this segment would enhance the accessibility of the area and intensify development interest. However, it is possible that the proposed route will be challenged in the courts by environmental groups on the grounds that it will go through the proposed Coyote Park chain. There is, moreover, the possibility that the State Division of Highways will restudy the four routes originally considered with the intent of resolving possible objections. Either of these possibilities might delay the scheduled completion beyond 1980. The following questions must be resolved: What new routes are being considered? How much time would another route's selection, design and construction take?

TABLE I-K
Morgan Hill Unified School District
CRITICAL DEVELOPMENT FACTORS BY STUDY AREA*

Study Area \ Development Factors	Oceanic Properties Developments	Fisher Creek Improvement	South Valley Freeway Completion	Sewage Lines Extension (Morgan Hill)	Greater Sewage Treatment Capacity (Morgan Hill)	Increased Minimum Lot Size	Annexation (to Morgan Hill)	Improved Water Supply	Flood Plain Protection	New Reservoir	Moratorium on Septic Tanks	Airport Development	Road Development	Industrial Development	Slope
1															
2	X	X	X			O								O	
3	X	X	X			O								O	
4	X	O	X			O								O	
5	X	O	X			O								O	
6	X	O	X											O	
7	X		X												O
8	X		X												O
9						O									X
10						X								O	O
11															O
12						X		X							X
13						X		X							X
14						X		O							X
15					O	O	O						O		O
16					X	O	X						O	O	O
17				O	O	X	O		O						X
18				X	X	O	X								O
19				X	X	O	X						O		X
20				O	O	X	O			X			O		
21			O	X	X	X	X	X			X	X			
22			O	X	X	O	X								
23			O	O	X		X						X		
24			O	X	X	O	X							X	
25			X	X	X	O	X							X	O
26					X		O							X	
27			O		X		O								X
28			O			X									X
29															X

* X - MOST SIGNIFICANT FACTORS
O - LESS SIGNIFICANT

4. Increased Minimum Lot Size

The minimum lot size in unincorporated areas is currently 2.5 acres. If a higher minimum of 5 or even 10 acres is adopted by the County Board of Supervisors, less development in unincorporated areas would be expected.

The minimum lot size of 2.5 acres has been in effect since March, 1972, having been raised at that time from one acre. Although the intent of the Board of Supervisors in raising the minimum lot size was to discourage development in unincorporated areas, a great deal of building activity has nevertheless taken place since the minimum was raised. However, it is too early to tell whether this level of building activity will continue or subside once the inventory of vacant one acre lots, created before the 2.5 acre minimum, is depleted.

5. Sewerage Lines Extension

Extension of the present network of sewerage lines would make possible both higher density development and wider dispersion. Presently, consideration is being given to the creation of three new assessment districts for the purpose of extending the sewerage line network (see Map 8b).

6. Greater Sewage Treatment Capacity

Expansion of the present sewage plant in Gilroy or construction of a new facility at Tick Canyon would allow further development beyond the 15,000 persons which could now be accommodated under the present sewage flow allocation agreement between Gilroy and Morgan Hill.

7. Annexation to Morgan Hill or San Jose

Annexation to the appropriate city, with subsequent rezoning, would allow a higher density of development under the new zoning and would make available the services necessary for more intensive development.

Moreover, development under the policies of the respective general plans of San Jose or Morgan Hill would lead to more intensive development than would be possible under the most permissive county zoning (2.5 acre minimum).

It is, however, possible that annexation could result in greater control over development and in a more logical and economical development pattern.

8. Improved Water Supply

Municipally provided water supplied would facilitate development in two areas: those located at too high an elevation to tap groundwater supplies, and those areas facing possible contamination of groundwater supplies by septic tanks.

9. Flood Plain Protection

Areas lying below reservoirs run some risk of severe flooding in the event of dam failure. These "flood plains" may be protected by restrictive zoning.

10. New Reservoir

A new reservoir south of Watsonville Road in Hayes Valley is presently under consideration (see Map 8b). It would be a multi-purpose facility intended primarily for recreation and water storage, with some flood control and percolation benefits.

This new reservoir would add a new visual and recreational amenity to this area and thereby enhance its development potential.

11. Moratorium on Septic Tanks

Construction of septic tanks for waste-water disposal may result in serious problems should a concentration of septic tanks in combination with poor soil permeability exist (see Map 8a).

When waste water from a septic tank is dispersed into the ground, it should be purified as it percolates through the soil. In those areas with poor permeability, the soil offers a greater resistance to downward flow. As a result, wastes are allowed to accumulate near the surface where they can flow laterally and invade water wells.

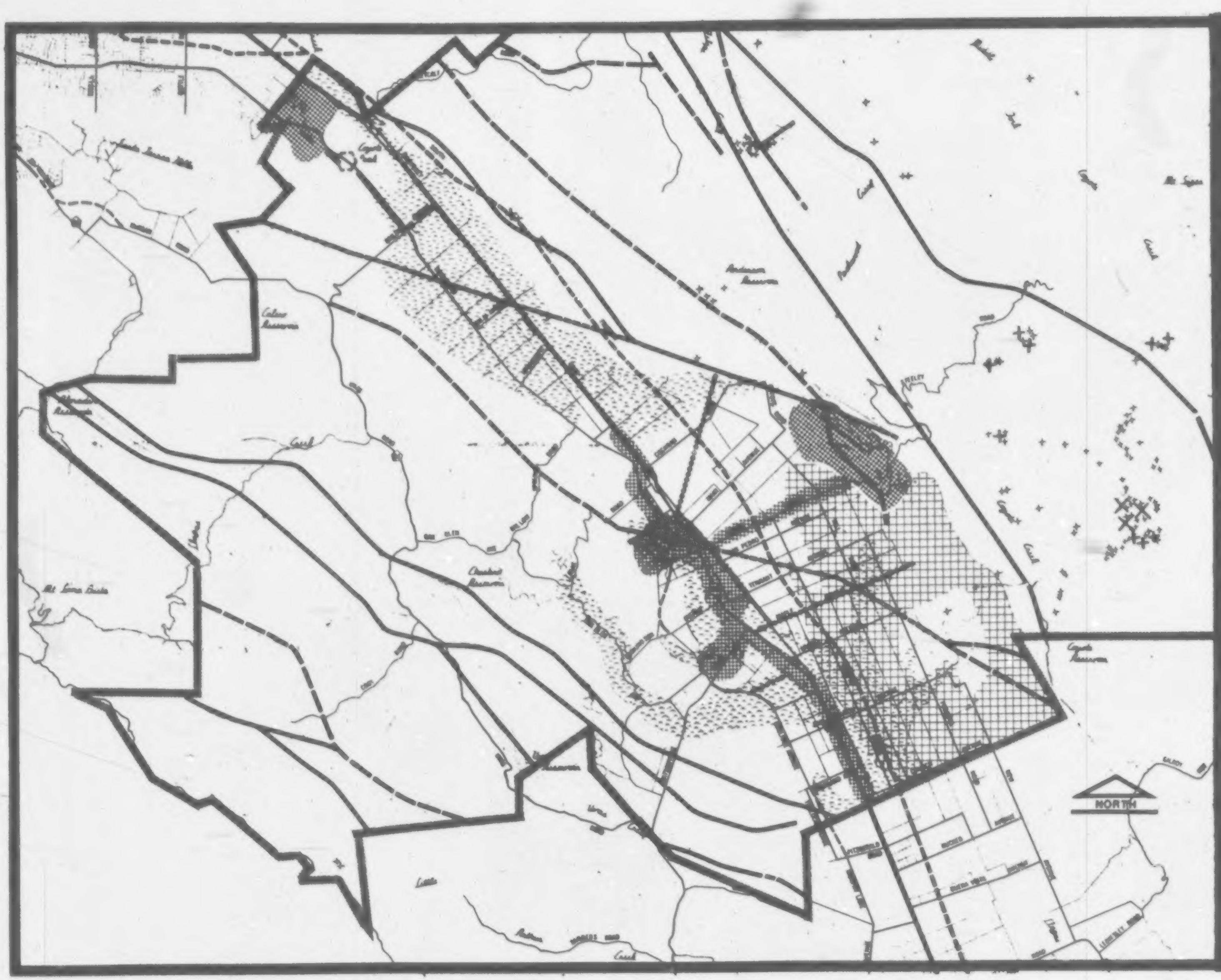
12. Airport Development

The new South County Airport is located near the intersection of San Martin and Murphy Avenues (see Map 8b). Industrial development around the airport could provide an additional market for housing and could also result in further residential construction in that area.

The county's airport plan calls for the construction of an additional runway, taxiway, and facilities for a fixed base operator and tie-down area. The county has submitted a federal grant application for reimbursement of funds spent on land acquisition around the airport.

13. Road Improvement

Most of the roads in the district are two-lane arteries originally intended to provide access to what has been, in the past, primarily rural land uses. As residential development proceeds throughout the area, these narrow, two-lane roads will receive a much higher level of traffic, overtaxing the road's vehicle-carrying capacity and causing a deteriorated road surface. The final result may be that no further development can occur until road improvement work is undertaken. A notable example is East Dunne Avenue which serves Jackson Oaks, Holiday Lakes, and which would serve other developments proposed for that area (Study Area 23).


Anderson Reservoir
Calero Reservoir
Chesbro Reservoir
Coyote Reservoir
Coyote Creek
Mt. Loma Prieta
NORTH

Map No. 6A

CRITICAL DEVELOPMENT FACTORS:
1. Engineering Problems

SEISMIC HAZARDS

Earthquake Faults-
- ▬ Recent Surface Fault Break
- ▬ ▬ Probable Surface Fault Break
- - - - Approximate Location of Faults (Below Ground)

Earthquake Epicenters
- X 3.5 or Greater (Richter Scale)
- + 2.5 - 3.5
- • 0.5 - 2.5

WASTE DISPOSAL
- ▦ Served by Existing Sewerage Lines
- ▫▫▫ Sewerage Assessment District Proposal
- ▬ Existing Sewerage Main
- ≡ Proposed Sewerage Main

FLOODS
- ░ Area Subject To 1% Flood

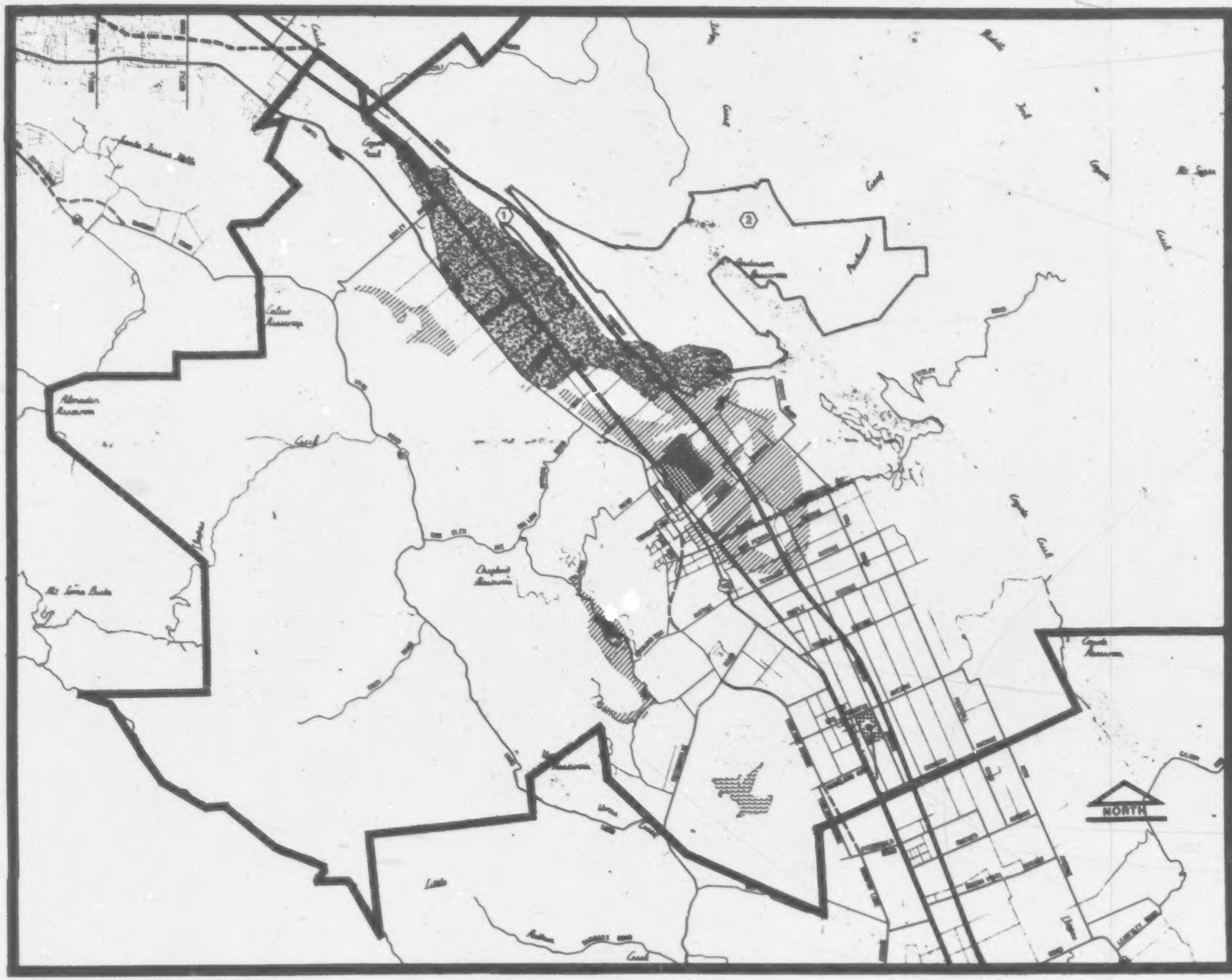
SLOPE
- ▒ Major Slope Contours

POSSIBLE SEPTIC TANK PROBLEMS
- ▦ Area Threatened by Ground Water Contamination (Due to Poor Soil Permeability and Concentrated Septic Tank Installation)

0 2000 8000
Scale (ft)

MASTER PLAN STUDY - 1974

Morgan Hill Unified
School District
September 1973



Map No. 8B

CRITICAL DEVELOPMENT FACTORS:

2. Major Land Development Options

OCEANIC PROPERTIES PROPOSALS
① Riverside Golf Course
② Lake Anderson

SOUTH VALLEY FREEWAY
━ Existing Segment
╍ Proposed Alignment (est. comp. 1980)

AGRICULTURAL PRESERVATION
Prime Agricultural Soils
▒ Soils Graded 'Excellent'
▨ Soils Graded 'Good'

ROAD IMPROVEMENTS
┅ Proposed Road Improvements

INDUSTRIAL DEVELOPMENT
▦ Major Sites Proposed for Industrial Development

WATER RESOURCE DEVELOPMENT
≋ Proposed Reservoir

0 2000 8000
Scale (ft)

MASTER PLAN STUDY - 1974

Morgan Hill Unified School District
September 1973

14. Industrial Development

Industrial development could provide an additional market for housing and could stimulate further residential construction around the area and throughout the district.

15. Slope

Much of the district lies in areas of rather steep slope. Here, development will take place at a much lower density, if at all. For example, in the unincorporated area under county jurisdiction, the minimum lot size for land of less than 10% slope is 2.5 acres. When the slope increases to 20%, the minimum lot size is 2.83 acres; at 30% slope, the minimum is 3.67 acres; and at 40% slope, it is 5.25 acres.

Development on slopes is more expensive than on flatter lands since steep grades present a host of engineering problems. Thus, slope development is in a less competitive position in the housing market and development in sloping areas is deferred to a later time.

1.2.4 Staff and Committee Judgments

The Land Use Subcommittee estimated future development in Morgan Hill Unified School District by making a subjective appraisal of the critical development factors and by using their own knowledge of the local area. The subcommittee estimated the percent of vacant land that would be developed in each study area at five year intervals, from 1975 to 1990. The estimates were translated into three possible growth rates: high, medium, and low. In most cases, the three rates were based on development factors which would influence development and cause it to proceed at a particular rate. In those study areas where no particular factor seemed critical to development, high, medium and low growth rates were predicted to anticipate several housing market conditions or unforeseen future development factors. The subcommittee's estimates are summarized in Tables I-L and I-M.

1.2.5 Use of Alternatives

The vast array of development patterns and rates of growth possible between 1975 and 1990 made it necessary to pose alternatives. The use of high, medium, and low estimates for projecting future development provides a range of alternatives based on rate of growth.

Three other alternatives were established, each taking into account specific uses of land as they have been defined by public development policies. These policies are the existing zonings and general plans of the respective local jurisdictions. The three alternatives were formulated as follows:

Alternative A - Follow city zoning within city limits and county zoning for remainder of district.

Alternative B - Follow city general plans for respective existing urban service areas. Remainder of areas to develop according to county zoning.

Alternative C - Follow city general plans for respective sphere of influence.

The two sets of alternatives, growth rates and land uses were combined by applying each of the three growth rates to each of the three land use patterns. The result is a set of nine alternative development possibilities. The array of alternatives generated by the study is summarized in section 1.4.

1.3 Analysis

Data analyzed in this section provides a basis for school planning in four major areas: (1) curriculum; (2) enrollment (school housing); (3) transportation; and (4) school site location. Because the district is only sparsely urbanized, the task of estimating change from current conditions is very difficult; first, because data is kept for large reference areas only; second, because urbanization patterns are not well established; and third, because trends are not strong or well defined.

But because the price of not being prepared for change is too costly, predictions have indeed been made. It is the conclusion of those who have conducted the Morgan Hill study that in the future, records need to be created so that subsequent predictive attempts will have a base upon which to build.

1.3.1 School Enrollment and Housing Type

School enrollment predictions have traditionally used "house counts" to estimate anticipated school children at various age levels. Normally, school districts assign "pupil generation rates" for the various housing types within attendance areas. To estimate growth of the semi-rural areas of Morgan Hill and environs, a "house count" was used as basic data. Type, size, value and location of houses, however, were also taken into consideration.

The enrollment projection technique required extensive historical data. Such data included information concerning migration, births, deaths, average number of children living in different house types (child yield) and other factors. The projection of future development, described earlier, provided the necessary data on future immigration, which was in turn used to determine the enrollment generated by new development in the district. Estimates of past migration, along with past births, allowed the computation of the present number of preschool age children who will mature, enter kindergarten, and progress through the higher grades.

TABLE I-L
Morgan Hill Unified School District
LAND USE SUBCOMMITTEE ESTIMATES
Vacant Land Brought Into Development by Year by Study Area
San Jose Sphere of Influence

Study Area	Low Growth Rate				Medium Growth Rate				High Growth Rate			
	Development Factor				Development Factor				Development Factor			
	%-'75	%-'80	%- 85	%-'90	%-'75	%-'80	%-'85	%-'90	%-'75	%-'80	%-'85	%-'90
1	15	80	100	100	40	100	100	100	100	100	100	100
	Note 1 or 3				Note 2				Note 4			
2	0	2	10	20	0	5	30	60	0	20	50	100
	Note 2 or 4				Note 1				Note 3			
3	0	2	12	25	0	5	20	35	0	10	22	35
	Note 2				Note 1 or 3				Note 4			
4	0	2	12	25	0	7	15	25	0	10	22	35
	Note 1 or 2				Note 4				Note 3			
5	1	5	20	40	2	30	50	90	2	45	75	90
					Note 1 or 2				Note 3 or 4			
6					0	0	8	20	0	7	25	50
					Note 1 or 2				Note 3 or 4			
7					0	0	5	10	0	2	10	30
					Note 1 or 2				Note 3 or 4			
8					1	1	2	5	0	0	2	10
	Note 1				Note 2				Note 3 or 4			
9	0	0	0	.5	0	.1	.5	1	0	.5	1	2
					Note 1				Note 2			
10					0	5	20	75	0	5	25	80
					Note 1 or 2				Note 3 or 4			
11					0	2	7	12	0	0	2	10

Note 1 - Oceanic Properties proposals not approved and flood control bond not passed.

Note 2 - Oceanic Properties proposals not approved and flood control bond passed.

Note 3 - Oceanic Properties proposals approved and flood control bond not passed.

Note 4 - Oceanic Properties proposals approved and flood control bond passed.

TABLE I-M
Morgan Hill Unified School District
LAND USE SUBCOMMITTEE ESTIMATES
Vacant Land Brought Into Development by Study Area by Year
Morgan Hill Sphere of Influence

Study Area	Low Growth Rate				Medium Growth Rate				High Growth Rate			
	Development Factor				Development Factor				Development Factor			
	%-'75	%-'80	%-'85	%-'90	%-'75	%-'80	%-'85	%-'90	%-'75	%-'80	%-'85	%- 90
12									Large scale land purchase w/ improved sewage and water			
	1	2	3	4	1	2	4	7	1	3	10	20
13									Improved sewage treatment & water supply			
	1	2	3	4	1	2	4	6	1	3	7	12
14												
	1	1	2	2	1	1	2	3				
15												
	5	10	20	30	5	15	25	40	10	30	40	70
16	increased minimum lot size				status quo				annexation to city			
	5	8	10	12	5	15	25	35	7	25	60	90
17	flood plain protection				increased minimum lot size				status quo			
	5	11	11	11	5	15	40	100	5	50	100	100
18	increased minimum lot size				status quo				annexation-sewer line extens.			
	5	8	10	12	5	20	50	75	5	50	100	100
19	status quo				sewage line extension				further annexation			
	10	20	30	30	10	25	35	35	10	35	100	100
20	increased minimum lot size				status quo				new reservoir			
	5	8	10	12	5	10	20	30	5	20	40	65
21	increased minimum lot size moratorium on septic tanks				status quo				annexation-sewers			
	5	7	15	25	5	15	30	40	5	20	40	60
22	increased minimum lot size				establishing percolation site				annexation-sewage line ex.			
	5	8	10	12	5	15	25	40	5	20	40	60
23	no road improvement				road improvement				early annexation			
	10	20	30	40	15	30	50	75	15	40	75	100
24	delayed freeway completion				annexation-sewage line exten.				industrial development			
	2	7	12	25	5	20	35	50	5	25	50	60
25	delayed freeway completion				annexation-sewage line exten.				industrial development			
	2	7	12	20	5	15	30	40	5	20	40	50
26												
	5	10	15	20	10	25	45	60	15	30	60	100
27												
	5	15	25	35	5	25	40	65	10	35	60	90
28	increased minimum lot size											
	0	1	2	3	2	5	8	11	2	7	15	25
29												
	0	0	0	.5	0	0	.5	1	0	.5	1	2

There was, however, insufficient data concerning child yield for Morgan Hill Unified School District. Determination of child yield requires data which will allow correlation between house type and school attendance. A special census done for the East Side Union High School District in 1972 provided the information needed for an accurate child yield to be calculated in those districts. The child yield figures for the Oak Grove School District, adjacent to Morgan Hill Unified School District on the north were used to project Morgan Hill's enrollment. It was determined that Oak Grove's yield factors were sufficiently close to Morgan Hill's for this first projection effort. Should a more detailed survey of Morgan Hill Unified School District be conducted in the future, present projections can be modified if yield factors are found to be substantially different from those of Oak Grove.

The yield factors used in the enrollment projection appear in Table I-M-2. Because the district's current housing stock will likely be eclipsed by new housing, it is important to assess possible housing stock changes which may affect child yield. It was found that a useful tool for that assessment was observing the type of housing in both larger and nearby jurisdictions which might give a clue to future trends in Morgan Hill.

The current dwelling type mix as compared with the county, Milpitas and San Jose is shown in Table I-N. Here the district's percentage of single family houses is the highest. As Morgan Hill Unified School District becomes more urbanized, its proportion of single family dwellings may decrease. This trend is indicated by construction occurring between 1970 to 1973. Table I-J is a tabulation of single family units occupied and multiple family units constructed from 1970 to 1973. During that period, 16.2% of the units constructed were multiple family, while 83.8% were single family. If this pattern continues for several years, the proportion of single family units will decline still further.

Construction trends in other parts of the county substantiate this conclusion. Between 1960 and 1969, 43.9% of the new dwelling units authorized by building permit in the county were of three units or more. In San Jose, 30.8% were of three or more units; in Campbell, 52.9% and in Mountain View, 83.3%. The experience of these last two cities is without question atypical. It is extremely doubtful that Morgan Hill's proportion of new multiple family dwelling units will ever reach that magnitude. Campbell and Mountain View's experience, however, clearly demonstrates the great demand for multiple family housing. Even more significantly, their experience suggests that as urbanization proceeds and the amount of vacant land is reduced, new construction will follow a more dense pattern.

1.3.2 Physical Features and Employment: Implications for Growth

Physical features have had and will continue to have a considerable influence on the location of new housing. Attractive physical surroundings such as mature trees or nearby streams, heights with a commanding view, topography which allows easy access and freedom from hazards of flooding and earthquakes are the dominant attractions. The great natural beauty of Paradise Valley, for example, has attracted considerable growth. Seventeen new homes were constructed there between 1970 and 1973 (refer to Table I-J).

TABLE I-M-2

Morgan Hill Unified School District
Yield Factors

Grade Level	Dwelling Type*	Yield Value (children per dwelling)		
		High	Medium	Low
1	SF	0.1112	0.0957	0.0802
	MF	0.0662	0.0381	0.0100
2	SF	0.1036	0.0874	0.0712
	MF	0.0788	0.0476	0.0164
3	SF	0.1099	0.0932	0.0765
	MF	0.0662	0.0381	0.0100
4	SF	0.0978	0.0817	0.0656
	MF	0.0927	0.0571	0.0215
5	SF	0.1035	0.0871	0.0707
	MF	0.0496	0.0262	0.0028
6	SF	0.0813	0.0666	0.0519
	MF	0.0583	0.0310	0.0037
7	SF	0.0814	0.0670	0.0526
	MF	0.0426	0.0214	0.0002
8	SF	0.0793	0.0652	0.0511
	MF	0.0426	0.0214	0.0002
9	SF	0.0623	0.0498	0.0373
	MF	0.0426	0.0214	0.0002
10	SF	0.0558	0.0441	0.0324
	MF	0.0433	0.0214	-0.0005
11	SF	0.0559	0.0437	0.0315
	MF	0.0275	0.0119	-0.0037
12	SF	0.0445	0.0340	0.0235
	MF	0.0415	0.0190	-0.0035

* SF - single family
MF - multiple family

TABLE I-N

Morgan Hill Unified School District, 1970
Dwelling Type Mix and Comparison with Other Jurisdictions

	Single Family	Multiple Family*	Mobile Home
County Average	66.9%	30.3%	2.8%
Morgan Hill U.S.D.	90.6%	5.5%	3.9%
Milpitas	82.8%	11.9%	5.3%
San Jose	70.0%	27.9%	2.1%

* Two or more units in structure

Source: Profile '70, a socio-economic data book for Santa Clara County

In study area 27, the Jackson-Holiday area, an exceptional view and remote setting have attracted growth. An example of an area where physical characteristics are an impediment to growth is Study Area 2, or the Calero Hills area. Here periodic flooding prevents extensive residential construction.

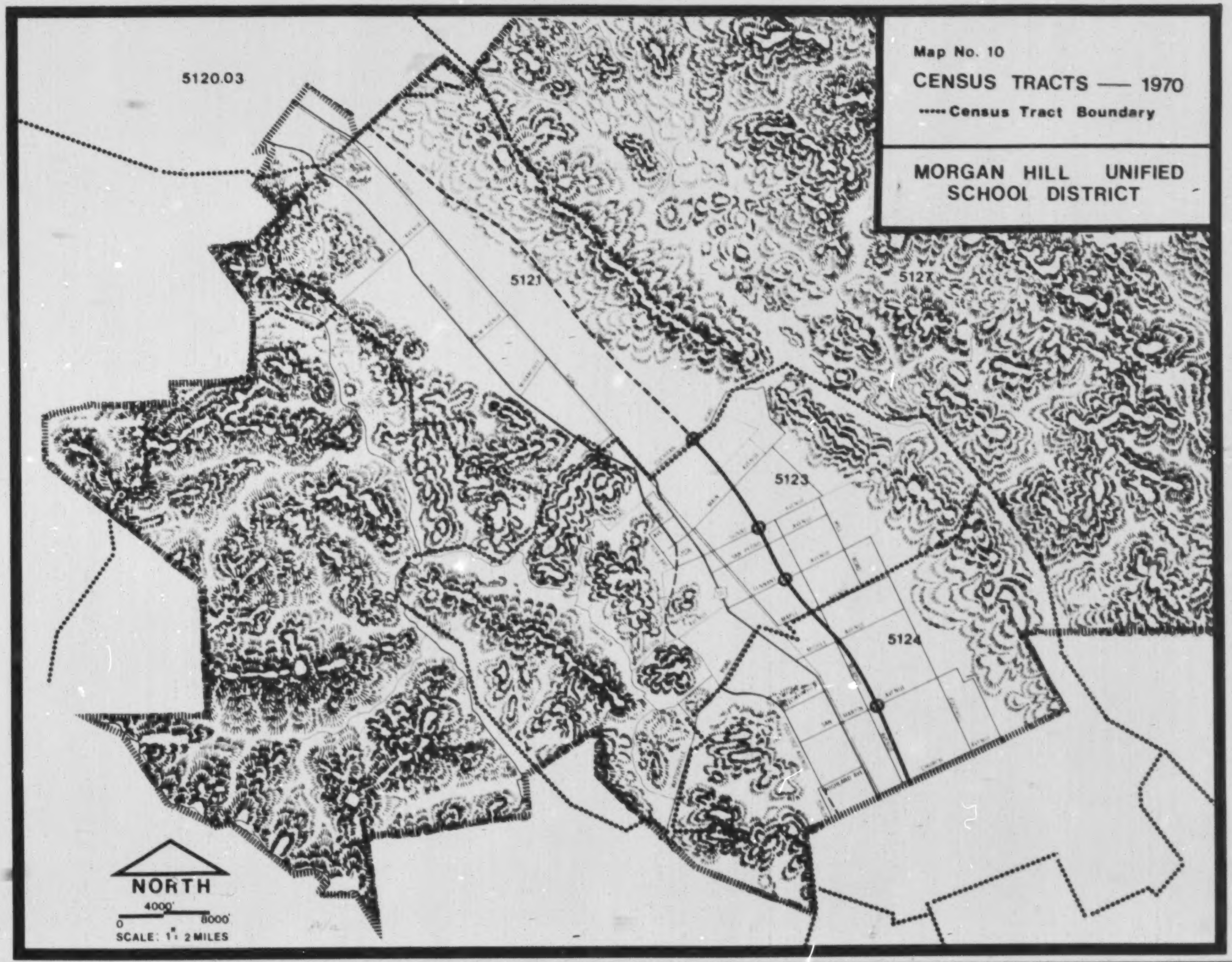
A second major influence upon the location of new housing is the proximity to employment or the proximity to transportation facilities that allow easy commuting. At present, employment opportunities within the district are not extensive. New migrants to the area will most likely work in San Jose or nearby cities, and thus the commute pattern of district residents will be to the north. This pattern will continue unless major new trends emerge in one or both of two areas. The first could be the introduction of new employment generators in the district which would reduce the necessity of long-distance commuting. The second might be changes in the commuting patterns of residents brought about by shortages of fuel or restrictions on travel to improve air quality. This second development, which might retard further growth in the district, could be mitigated by improved mass transit facilities.

1.3.3 Recommendations for Future Data Maintenance

The existing body of data concerning the district's socio-economic conditions, its construction activity and trends, migration patterns, and other significant factors is by no means complete or comprehensive. Morgan Hill Unified School District is not unique in this respect. "Insufficient data" is the inevitable lament of social scientists, economists, urban planners, and educators who attempt to better understand and manage our complex social system. With this in mind, it is essential that new data be collected, that its deficiencies be noted and that plans be made for better data collection in the future.

Past sections of this report have presented several tables detailing certain socio-economic and housing characteristics extracted from the 1970 U.S. Census (these having been factored to the school district boundaries which do not correspond to census tract boundaries) and from the Harrington Housing Reports. In this section, selected statistics from Profile '70 are presented in Table I-M-1 (Map 10, Census Tracts, 1970). Profile '70 is, in turn, a summary of selected data from the 1970 U.S. Census with an added analytical framework allowing comparison of some data items with other census tracts in the county.

While the earlier tables indicated the characteristics of the district as a whole, Table I-M-1 shows the composition of census tracts within the district and allows a finer grained analysis. An example of the kind of analysis possible with data describing a smaller area is the significant differences between census tracts 5123 and 5124. Tract 5123, which includes most of the City of Morgan Hill, is adjacent to tract 5124, which includes San Martin. A comparison of these two tracts indicates that 5124 has: (1) a greater percentage of people with incomes below the poverty line;


5120.03
5121
5122
5123
5124
5127
NORTH
0
4000'
8000'
SCALE: 1" = 2 MILES

Map No. 10

CENSUS TRACTS — 1970

----- Census Tract Boundary

MORGAN HILL UNIFIED SCHOOL DISTRICT

TABLE I-M1

Morgan Hill Unified School District - 1970
SELECTED SOCIO-ECONOMIC STATISTICS
From Profile '70 - A Socio-Economic Data Book for Santa Clara County

	CENSUS TRACTS (1)											
	5120.03		5121		5122		5123		5124		5127	
	Value	Rank (2)	Value	Rank (2)	Value	Rank (2)	Value	Rank (2)	Value	Rank (2)	Value	Rank (2)
Total Population	16767	NR	1410	NR	1224	NR	7662	NR	4210	NR	(3)	
Total Housing Units	4538	NR	341	NR	386	NR	2236	NR	1283	NR	(3)	
Households with Woman Head: Total	5.6%	204	12.5%	141.5	10.9%	167.5	17.1%	97	12.3%	146.5	20.6%	72
White SSL (4)	2.2%	139	18.0%	47	UNAV	UNAV	10.3%	89.5	9.7%	96	UNAV	UNAV
Households with Income Below Poverty Line: Total	1.5%	206	31.0%	4	19.7%	18.5	14.4%	35.5	17.4%	26	18.5%	24
White SSL (4)	2.8%	121	29.1%	7	UNAV	UNAV	25.4%	11	16.2%	38	UNAV	UNAV
Persons 65+ with Income Below Poverty Line	7.5%	144.5	39.8%	5	55.3%	1	25.7%	30	34.6%	11	UNAV	UNAV
Unemployed Persons: Total	3.4%	179	10.8%	17	9.5%	34	3.6%	169.5	9.7%	32	0.0%	206.5
Women	6.4%	106.5	17.0%	12	21.1%	6	3.7%	171	9.4%	57.5	0.0%	206.5
No. of years in Housing Unit: ∠ 2 yrs.	69.2%	11	42.3%	93	9.5%	34	42.0%	94	35.1%	131	0.0%	206.5
More 20 yrs.	1.2%	139.5	10.7%	34	21.1%	6	7.6%	49.5	9.4%	38.5	41.3%	1
Housing Units Built Before 1950	3.0%	157	55.0%	34	55.0%	34	37.0%	55.5	56.0%	30.5	49.0%	39.5
Housing Units Built After 1965	87.0%	1	8.0%	132.5	10.0%	121	23.0%	60	16.0%	81.5	16.0%	81.5
Crowding: Housing Units with 1.01 or more PPR (5): Total	2.7%	165.5	26.6%	5	11.3%	39.5	14.0%	24	20.8%	12	13.5%	25.5
White SSL (4)	2.0%	137.5	33.0%	16.5	UNAV	UNAV	35.0%	10.5	44.0%	3.5	UNAV	UNAV
Households with no car	1.4%	176.5	11.2%	44	10.1%	47.5	9.2%	55	7.6%	67.5	0.0%	204
Fertility Rate: Births per 1000 females, 15-44	134.4	16	39.3	184	58.6	143	69.3	114	105.8	39	35.2	191
Age-adjusted Death Rate	4.28	159	4.24	160	2.03	201	7.25	52	5.52	110	0.0	206
Juvenile Probation Referrals: As % of Population 10-17 (6/70-6/71)	5.6	147.5	2.5	198	16.2	29	8.5	90	6.1	138	1.3	203.5
Adult Arrests (3/72-9/72): Total	142	NR	9	NR	1	NR	61	NR	37	NR	3	NR
As % of Population Over 17	1.5	NR	1.2	NR	0.15	NR	1.9	NR	0.9	NR	(3)	NR
Public Assistance (1/73): Total Cases	350	NR	1	NR	42	NR	475	NR	321	NR	18	NR
Total Persons	904	NR	1	NR	79	NR	1065	NR	808	NR	58	NR
As % of Population	5.4	NR	0.07	NR	6.5	NR	13.9	NR	19.2	NR	(3)	NR
AFDC: Total Cases	196	NR	0	NR	20	NR	234	NR	161	NR	11	NR
Total Persons	701	NR	0	NR	57	NR	785	NR	627	NR	50	NR
As % of Population	4.2	NR	0	NR	4.7	NR	10.2	NR	14.9	NR	(3)	NR
Total Certified for Medi-Cal	410	NR	9	NR	94	NR	1212	NR	880	NR	69	NR
Total Certified for Food Stamps	249	NR	142	NR	58	NR	881	NR	665	NR	77	NR
Federally Assisted Housing Units: Total	296	NR	1	NR	1	NR	145	NR	4	NR	0	NR

NOTES: UNAV - Unavailable; NR - Not Ranked

(1) Only parts of tracts 5120.03, 5122, 5124 and 5127 are in the school district. All of tracts 5121 and 5123 are in district; (2) Rank refers to the relative position of this census tract to other census tracts (all other tracts in the county) for the given year; (3) Data for this tract is unreliable; (4) White SSL refers to white persons of Spanish surname or Spanish language; (5) PPR means persons per room.

(2) a greater percentage of people 65 and over with incomes below the poverty line; (3) a higher percentage of unemployed; (4) a much greater percentage of old housing units; (5) a greater degree of crowding; (6) a much higher fertility rate; and (7) far fewer federally assisted housing units. Such information is invaluable in efforts to isolate social problems, gauge the effectiveness of proposed solutions and determine the direction of future efforts to improve conditions in various parts of the district.

Despite the relative usefulness of census tract data, it is highly desirable to have data for a much smaller area. Each tract mentioned above contains over 21,000 acres; and as growth continues, it will become increasingly difficult to isolate problems at a level which allows effective problem/solution analysis.

The study areas established for the Morgan Hill Unified School District analysis have filled this need for a smaller level of data collection. But, since the census tract is the smallest unit for which data is currently available, it is, at present, impossible to develop data for the study areas. It remains the task of some future study to gather data at the more useful study area level.

1.4 Projections

The results of applying development estimates against available vacant land slated for residential use appear in Tables I-O, I-P, I-Q and I-R. As detailed in section 1.2.5, the development estimates have been formulated into three land use alternatives and, within each land use alternative, three alternative growth rates have been applied. The result is an array of development alternatives at five-year intervals from 1975 to 1990. These alternatives specify the number of new single family and new multiple family housing units that will be constructed during each of the respective years.

The totals presented in the tables are cumulative. That is, the totals for 1980 include those new units built by 1975, plus those built between 1975 and 1980; the totals for 1985 include those new units built by 1980, plus the units built between 1980 and 1985; and so on. Figure 2, Key to Projection Tables, is a guide for reading the tables.

Table I-S depicts alternative D, or what is called the "most likely" alternative. This represents a composite of all nine "possibilities" for development (three growth rates applied against three land use patterns resulting in nine "possibilities") which is judged to be the most likely pattern of future growth. This "most likely" alternative was chosen by the Planning Resources Office staff through individual examination of each study area. It provides a more manageable tool for assessing the implications of the projections generated by the study.

TABLE I-o
Morgan Hill Unified School District
PROJECTED NEW DWELLING UNITS BY STUDY AREA BY ALTERNATIVE FOR 1975

Study Area	ALTERNATIVE A ZONING THROUGHOUT DISTRICT						ALTERNATIVE B GENERAL PLANS INSIDE SERVICE AREAS - ZONING ELSEWHERE						ALTERNATIVE C GENERAL PLANS THROUGHOUT DISTRICT					
	Low		Medium		High		Low		Medium		High		Low		Medium		High	
	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF
1	189	0	500	0	1283	0	189	0	500	0	1283	0	189	0	500	0	1283	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	27	0	55	0	55	0	26	0	52	0	52	0	0	0	0	0	0	0
6			0	0	0	0			0	0	0	0			0	0	0	0
7			0	0	0	0			0	0	0	0			0	0	0	0
8			0	0	0	0			0	0	0	0			0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10			0	0	0	0			0	0	0	0			0	0	0	0
11			0	0	0	0			0	0	0	0			0	0	0	0
12	3	0	3	0	3	0	6	0	6	0	6	0	20	0	20	0	20	0
13	4	0	4	0	4	0	24	0	24	0	24	0	55	0	55	0	55	0
14	1	0	1	0	1	0	4	0	4	0	4	0	0	0	0	0	0	0
15	7	0	7	0	15	0	58	0	58	0	117	0	39	0	39	0	76	0
16	46	8	46	8	61	11	71	20	71	20	92	30	59	20	59	20	107	28
17	6	0	6	0	6	0	25	0	25	0	25	0	51	0	51	0	51	0
18	9	0	9	0	9	0	81	0	81	0	81	0	80	20	80	20	80	20
19	178	5	178	5	178	5	192	203	192	203	192	203	267	203	267	203	267	203
20	30	0	30	0	30	0	40	0	40	0	40	0	33	0	33	0	33	0
21	69	0	69	0	69	0	147	40	147	40	147	40	655	188	655	188	655	188
22	28	16	28	16	28	16	134	140	134	140	134	140	168	180	168	180	168	180
23	180	0	278	0	278	0	121	350	161	520	161	520	137	348	205	522	205	522
24	12	16	14	64	14	64	40	100	100	240	100	240	50	100	115	240	115	240
25	22	0	72	0	72	0	14	52	19	130	19	130	10	52	42	130	42	130
26	213	144	426	304	640	464	14	60	31	130	46	190	11	60	24	130	37	190
27	73	32	73	32	146	62	150	0	150	0	304	0	196	0	196	0	389	0
28	0	0	1	0	1	0	0	0	14	0	14	0	0	0	37	0	37	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1097	221	1800	429	2893	622	1336	965	1809	1423	2841	1493	2020	1171	2546	1633	3620	1701

Low, medium, high denote growth rates; see Tables ______. SF- single family dwelling unit MF-multiple family dwelling unit

TABLE I-P
Morgan Hill Unified School District
PROJECTED NEW DWELLING UNITS BY STUDY AREA BY ALTERNATIVE FOR 1980

Study	ALTERNATIVE A ZONING THROUGHOUT DISTRICT						ALTERNATIVE B GENERAL PLANS INSIDE SERVICE AREAS - ZONING ELSEWHERE						ALTERNATIVE C GENERAL PLANS THROUGHOUT DISTRICT					
	Low		Medium		High		Low		Medium		High		Low		Medium		High	
Area	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF
1	1000	0	1283	0	1283	0	1000	0	1283	0	1283	0	1000	0	1283	0	1283	0
2	184	0	452	0	1824	0	218	0	539	0	2169	0	1	0	3	0	11	0
3	17	0	33	0	67	0	26	0	54	0	106	0	0	0	1	0	2	0
4	12	0	33	0	41	0	96	0	348	0	496	0	1	32	6	112	9	160
5	136	0	827	0	1244	0	136	0	831	0	1250	0	0	0	0	0	0	0
6			0	0	242	0			0	0	242	0			0	0	0	0
7			0	0	58	0			0	0	69	0			0	0	19	0
8			2	0	0	0			24	0	0	0			23	0	0	0
9	0	0	0	0	0	0	0	0	1	0	6	0	0	0	7	0	33	0
10			125	0	125	0			232	0	232	0			42	0	42	0
11			0	0	15	0			0	0	67	0			0	0	16	0
12	5	0	5	0	7	0	17	0	17	0	18	0	38	0	38	0	57	0
13	7	0	7	0	11	0	43	0	43	0	69	0	110	0	110	0	167	0
14	1	0	1	0	2	0	19	0	19	0	20	0	21	0	21	0	21	0
15	15	0	22	0	45	0	115	0	173	0	347	0	76	0	116	0	232	0
16	69	13	130	24	222	40	109	32	208	60	345	100	105	32	207	60	344	100
17	14	0	19	0	64	0	56	0	74	0	251	0	188	0	257	0	512	0
18	15	0	38	0	95	0	113	0	311	0	782	0	122	34	308	80	775	210
19	356	16	449	16	627	16	385	406	479	500	1337	710	535	406	666	500	933	710
20	48	0	58	0	116	0	68	0	86	0	172	0	52	0	64	0	129	0
21	93	0	193	0	262	0	205	50	437	100	244	140	920	260	1970	560	2630	750
22	39	16	85	32	113	48	212	220	396	420	575	560	276	290	510	540	684	720
23	361	0	557	0	745	0	216	700	322	1040	433	1400	275	700	410	1040	550	1400
24	2	80	63	256	79	320	146	340	416	970	517	1210	160	340	460	970	575	1210
25	107	0	232	0	305	0	69	180	145	390	195	520	261	130	353	1040	494	1300
26	426	304	1066	784	1280	944	31	130	79	320	91	380	24	130	61	320	73	380
27	219	94	365	150	509	222	454	0	756	0	1063	0	588	0	761	0	1367	0
28	8	0	4	0	6	0	6	0	29	0	40	0	19	0	94	0	139	0
29	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	86	0
Total	3134	523	6049	1262	9387	1590	3740	2058	7302	3800	12439	5020	4671	2354	7770	5222	11183	6940

Low, medium, high denote growth rates; see Tables _____, SF-single family dwelling unit; MF-multiple family dwelling unit

TABLE I-Q
Morgan Hill Unified School District
PROJECTED NEW DWELLING UNITS BY STUDY AREA BY ALTERNATIVE FOR 1985

Study	ALTERNATIVE A ZONING THROUGHOUT DISTRICT						ALTERNATIVE B GENERAL PLANS INSIDE SERVICE AREAS - ZONING ELSEWHERE						ALTERNATIVE C GENERAL PLANS THROUGHOUT DISTRICT					
	Low		Medium		High		Low		Medium		High		Low		Medium		High	
Area	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF
1	1283	0	1283	0	1283	0	1283	0	1283	0	1283	0	1283	0	1283	0	1283	0
2	911	0	2742	0	4574	0	1087	0	3270	0	5455	0	6	0	17	0	28	0
3	78	0	142	0	153	0	126	0	220	0	240	0	3	0	4	0	5	0
4	46	0	61	0	87	0	46	0	61	0	87	0	10	192	12	240	18	352
5	554	0	1381	0	2072	0	556	0	1387	0	2081	0	0	0	0	0	0	0
6			272	0	862	0			272	0	862	0			0	544	0	1696
7			144	0	288	0			171	0	343	0			10	48	21	96
8			48	0	48	0			70	0	70	0			23	32	23	32
9	0	0	0	0	0	0	0	0	6	0	12	0	0	0	33	0	66	0
10			506	0	631	0			935	0	1168	0			555	0	693	0
11			15	0	45	0			67	0	231	0			16	0	54	0
12	7	0	9	0	23	0	18	0	28	0	59	0	40	0	53	0	136	0
13	11	0	15	0	26	0	69	0	92	0	161	0	167	0	223	0	389	0
14	2	0	2	0	2	0	38	0	38	0	55	0	42	0	42	0	63	0
15	30	0	37	0	60	0	232	0	290	0	908	0	83	0	104	0	206	0
16	95	19	222	47	528	113	91	40	345	100	829	240	136	40	344	100	827	240
17	14	0	51	0	128	0	56	0	201	0	504	0	112	0	802	0	2698	0
18	18	0	95	0	190	0	155	0	790	0	1564	0	154	43	776	215	1551	430
19	535	16	627	16	3360	48	580	600	674	710	1922	2030	796	600	933	710	2663	2030
20	58	0	116	0	232	0	101	0	201	0	391	0	125	0	251	0	502	0
21	193	0	394	0	525	0	437	100	875	200	1166	280	1970	560	3940	1130	5255	1500
22	56	16	142	32	227	64	263	279	659	700	1061	1116	341	360	852	900	1368	1440
23	557	0	924	0	1400	0	322	1040	544	1740	816	2610	410	1040	685	1740	1025	2610
24	38	144	111	448	159	640	251	580	728	1700	1039	2430	275	580	805	1700	1150	2430
25	180	0	464	0	617	0	117	310	297	780	351	1040	117	310	297	780	351	1040
26	640	464	1920	1424	2568	1888	46	190	141	580	184	770	37	190	112	580	146	770
27	365	150	584	240	874	360	756	0	1211	0	1821	0	977	0	1565	0	2345	0
28	1	0	6	0	13	0	14	0	53	0	100	0	37	0	152	0	286	0
29	0	0	0	0	0	0	0	0	20	0	40	0	0	0	86		172	0
Total	5673	809	12313	2207	20975	3113	6644	3139	14929	6510	24803	10516	7121	3915	13975	8719	23324	14666

Low, medium, high denote growth rates; see Tables ______________. SF-single family dwelling unit; MF-multiple family dwelling unit.

TABLE I- R
Morgan Hill Unified School District
PROJECTED NEW DWELLING UNITS BY STUDY AREA BY ALTERNATIVE FOR 1990

Study Area	ALTERNATIVE A ZONING THROUGHOUT DISTRICT						ALTERNATIVE B GENERAL PLANS INSIDE SERVICE AREAS - ZONING ELSEWHERE						ALTERNATIVE C GENERAL PLANS THROUGHOUT DISTRICT					
	Low		Medium		High		Low		Medium		High		Low		Medium		High	
	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF	SF	MF
1	1283	0	1283	0	1283	0	1283	0	1283	0	1283	0	1283	0	1283	0	1283	0
2	1824	0	5486	0	9148	0	2175	0	6543	0	10898	0	11	0	34	0	56	0
3	176	0	244	0	244	0	276	0	383	0	383	0	6	0	8	0	8	0
4	95	0	95	0	136	0	96	0	96	0	136	0	21	400	21	400	30	560
5	1108	0	2489	0	2489	0	1113	0	2500	0	2500	0	0	0	0	0	0	0
6			681	0	1724	0			681	0	1724	0			0	1360	0	3392
7			288	0	864	0			2261	0	1030	0			98	80	292	240
8			119	0	237	0			173	0	345	0			58	80	116	176
9	0	0	0	0	0	0	6	0	12	0	24	0	66	0	132	0	264	0
10			1898	0	2024	0			3508	0	3741	0			412	0	453	0
11			70	0	80	0			276	0	327	0			76	0	92	0
12	9	0	16	0	46	0	23	0	41	0	118	0	74	0	132	0	316	0
13	15	0	22	0	44	0	92	0	138	0	276	0	223	0	335	0	556	0
14	2	0	2	0	3	0	38	0	55	0	75	0	42	0	63	0	84	0
15	45	0	60	0	104	0	347	0	464	0	821	0	132	0	308	0	537	0
16	112	19	892	56	1781	144	165	50	484	140	1247	360	166	50	483	50	1243	360
17	14	0	128	0	128	0	56	0	504	0	504	0	112	0	2648	0	2698	0
18	22	0	142	0	190	0	185	0	1173	0	1565	0	184	50	1163	320	1551	430
19	535	16	627	16	3360	48	580	600	674	710	1922	2030	796	600	933	710	2663	2030
20	69	0	174	0	378	0	103	0	258	0	559	0	150	0	372	0	415	0
21	332	0	520	0	788	0	727	170	1166	280	1785	410	3135	940	5255	1500	7885	2260
22	63	16	227	96	348	144	319	335	1061	1116	1714	1670	408	430	1368	1440	2045	2160
23	745	0	1958	0	1874	0	433	1400	816	2610	1088	3480	550	1400	1025	2610	1370	3480
24	79	320	159	640	318	768	517	1210	1039	2430	1245	2920	575	1210	1150	2430	1385	2920
25	305	0	617	0	777	0	195	520	411	1040	486	1300	261	130	353	1040	494	1300
26	854	640	2568	1888	4268	3168	64	270	184	770	183	1280	58	270	146	770	250	1280
27	511	218	947	404	1312	558	1063	0	1974	0	2734	0	1367	0	2543	0	3521	0
28	1	0	9	0	22	0	20	0	126	0	288	0	58	0	208	0	474	0
29	0	0	0	0	0	0	20	0	40	0	80	0	86	0	172	0	344	0
Total	8199	1229	21721	3100	33970	4830	9896	4555	28324	9096	39081	13450	9764	5480	20829	12790	30425	20588

Low, medium, high denote growth rates; see Tables ________. SF-single family dwelling unit; MF-multiple family dwelling unit.

FIGURE 2: KEY TO PROJECTION TABLES

Land Use Pattern to be followed (see also section 1.2.5)

Growth Rate

Dwelling unit type:
SF = single family
MF = multiple family

This table entry means that in Study Area 1, 189 new single family units will be constructed by the end of 1975 if a low growth rate holds.

This entry indicates no development in Study Area 2 by 1975 under the low growth rate.

TABLE I-0
Morgan Hill Unified School District
Projected New Dwelling Units by Study Area by Alternative for 1975

Study Area	ALTERNATIVE A Zoning Throughout District						AL
	Low		Medium		High		Low
	SF	MF	SF	MF	SF	MF	SF
1	189	0	500	0	1283	0	189
2	0	0	0	0	0	0	0
28	0	0	1	0	1	0	0
29	0	0	0	0	0	0	0
Total	1097	221	1800	429	2893	622	1336

All projections in this table are for 1975; i.e., the new dwelling units to be built between now (defined as the end of 1973) and the end of 1975.

This entry indicates no multiple family units will be constructed in Study Area 1 by 1975 under this growth rate. Since the entry to the left (1283 SF units) indicates that development of another type will occur, the "0" for multiple family units can only mean that under this land use pattern (Alternative A), no land in Study Area 1 is zoned for multiple family use.

This entry is the total number of new single family units that will be constructed by 1975 in the entire district if the low growth rate holds.

TABLE I-S
Morgan Hill Unified School District
PROJECTED NEW DWELLING UNITS BY STUDY AREA
MOST LIKELY ALTERNATIVE "D"

Study Area	Rate	Alt	'75 SF	'75 MF	'80 SF	'80 MF	'85 SF	'85 MF	'90 SF	'90 MF
1	Med	A	500	0	1283	0	1283	0	1283	0
2	Low	A	0	0	184	0	911	0	1824	0
3	Hi	A	0	0	67	0	153	0	244	0
4	Med	A	0	0	33	0	61	0	95	0
5	Hi	A	55	0	1244	0	2072	0	2489	0
6	Hi	A	0	0	242	0	862	0	1724	0
7	Med	A	0	0	0	0	144	0	288	0
8	Med	A	0	0	2	0	48	0	119	0
9	Low	A	0	0	0	0	0	0	0	0
10	Med	A	0	0	125	0	506	0	1898	0
11	Med	A	0	0	0	0	15	0	70	0
12	Hi	C	20	0	57	0	136	0	316	0
13	Med	C	55	0	110	0	223	0	335	0
14	Med	C	0	0	21	0	42	0	63	0
15	Low	A	7	0	15	0	30	0	45	0
16	Hi	C	107	28	344	100	827	240	1243	360
17	Hi	A	6	0	64	0	128	0	128	0
18	Med	A	9	0	38	0	95	0	142	0
19	Med	B	192	203	946	500	674	710	674	710
20	Med	A	30	0	58	0	116	0	174	0
21	Med	A	69	0	193	0	394	0	520	0
22	Hi	C	168	180	684	720	1368	1440	2045	2160
23	Hi	C	205	522	550	1400	1025	2610	1370	3480
24	Med	B	100	240	416	970	728	1700	1039	2430
25	Med	B	19	130	145	390	297	780	411	1040
26	Med	B	31	130	79	320	141	580	184	770
27	Hi	C	389	0	1367	0	2345	0	3521	0
28	Med	A	1	0	4	0	6	0	9	0
29	Low	A	0	0	0	0	0	0	0	0
			1963	1433	9704	4400	14630	8060	21643	10590

Alternative D can be used as the "working estimate" for school planning activities. As such, it can be modified to account for changes in public policy by merely selecting another of the "possibilities" deemed more likely to fit current conditions.

The "most likely" patterns chosen for Study Areas 5, 7, and 8 can demonstrate both the method by which an alternative can be modified, and the importance of periodic data updating. Oceanic Properties owns and has proposed to develop parts of these three study areas. When the "most likely" alternative was chosen several months ago, it was predicted that Oceanic's development proposal would be approved by the San Jose City Council. Such an approval would affect development in the surrounding areas (e.g. , Study Area 6) and the net result would be a high rate of growth. Since Oceanic has withdrawn its proposal but has expressed its intention of resubmitting it at a later date, the "most likely" development pattern for this area will need to be reassessed when firm's intentions are known and when the decision of the San Jose City Council has been reached. If the development is indeed approved, it might be appropriate to "slide" the projection date ahead. It will also be necessary to examine the size of the development Oceanic resubmits and alter the magnitude of the projection accordingly.

Table I-T is a summary of the total number of dwelling units expected in the entire district for all the development alternatives. This table represents the total number of units; that is, the existing number of dwelling units as of the end of 1973 plus the total number of projected new dwelling units. (The number of existing units has been estimated as 5484 single family units and 632 multiple family units.)

2.1 Update

The long-term usefulness of the projections made in this study depends on periodic re-evaluation to account for actual development. The "updating" of the study's projections must accomplish three objectives. First, the information base used to make the projections must be brought up to date and made to reflect new conditions influencing development and changes altering previous assumptions. Second, the actual development which has occurred since the projections were last made must be identified and compared with that which was projected. This provides both a new base from which new development will be projected and feedback indicating the forecasting procedures degree of success. Third, the updated information base must be used again to produce new projections of future development.

Figure 3 presents a flow chart of one set of procedures which could be used to update the projections. It details both the steps and sequence required for the up-date procedure. (The numbers appearing by each of the boxes comprising the flow chart correspond to the numbered steps below).

1. Step one consists of updating the body of information detailing the amount of acreage in each residential zoning category, and in each residential land use category specified in the general plans. In addition, the densities (in dwelling units per acre) appropriate to each residential category must be reviewed for possible changes. (Residential category refers to single family or multiple family units under zoning and low, medium or high density under general plan).

TABLE I-T
Morgan Hill Unified School District
SUMMARY OF PROJECTED TOTAL DWELLING UNITS FOR SCHOOL DISTRICT BY ALTERNATIVE AND BY YEAR AND CORRESPONDING YEARLY GROWTH RATE

ALTERNATIVE									
Alternative Set	Growth Rate	Dwelling Unit Type*	1975 (DU)	Yearly Growth Rate 75-80 (%)	1980 (DU)	Yearly Growth Rate 80-85 (%)	1985 (DU)	Yearly Growth Rate 85-90 (%)	1990 (DU)
A	low	SF	6581	5.4	8618	5.2	11157	4.1	13683
A	low	MF	853	6.1	1155	4.4	1441	5.1	1861
A	med	SF	7284	9.2	11153	8.7	17797	8.5	27205
A	med	MF	1061	12.3	1894	8.1	2839	5.5	3732
A	hi	SF	8377	12.2	14871	12.2	26459	8.0	39394
A	hi	MF	1254	12.1	2222	11.0	3745	7.5	5462
B	low	SF	6820	6.0	9224	5.5	12128	4.8	15380
B	low	MF	1597	11.0	2690	6.8	3771	6.4	5187
B	med	SF	7293	11.9	7302	9.4	20413	10.6	33808
B	med	MF	2055	16.6	4432	9.5	7142	6.2	9728
B	hi	SF	8325	16.6	17923	11.1	30287	7.7	44565
B	hi	MF	2125	21.2	5652	14.5	11138	4.8	14082
C	low	SF	7504	6.1	10155	4.3	21605	3.9	15248
C	low	MF	1803	10.6	2986	8.4	4547	6.1	6112
C	med	SF	8030	10.5	13254	7.7	19459	6.2	26313
C	med	MF	2265	20.9	5854	9.4	9351	5.8	12422
C	hi	SF	9104	12.9	16667	11.6	28808	4.5	35909
C	hi	MF	2333	26.6	7572	15.1	15298	6.7	21220

* SF - single family
MF - multiple family

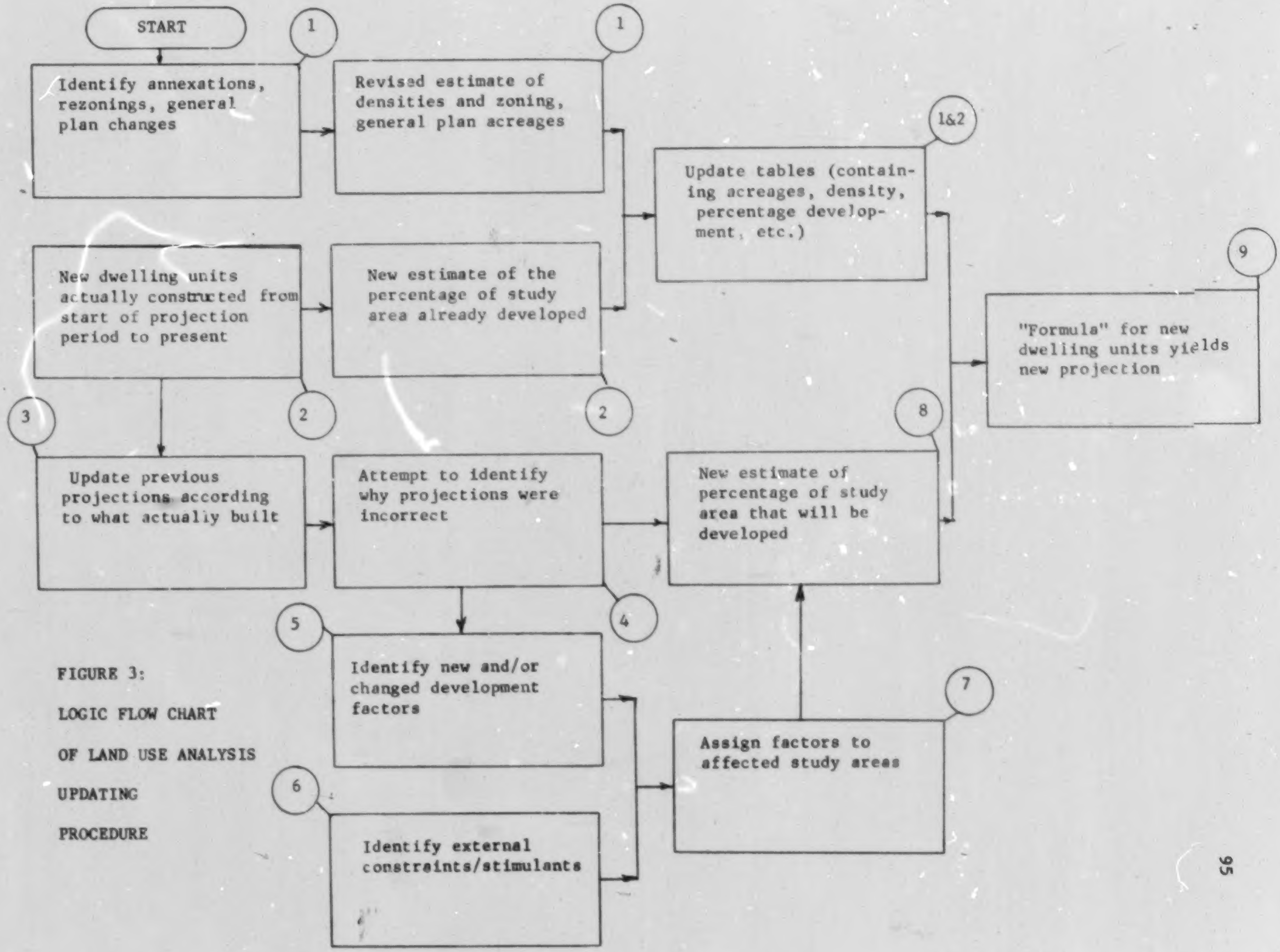

START
1
Identify annexations, rezonings, general plan changes
1
Revised estimate of densities and zoning, general plan acreages
1&2
Update tables (containing acreages, density, percentage development, etc.)
9
"Formula" for new dwelling units yields new projection
New dwelling units actually constructed from start of projection period to present
2
New estimate of the percentage of study area already developed
2
3
Update previous projections according to what actually built
Attempt to identify why projections were incorrect
4
8
New estimate of percentage of study area that will be developed
5
Identify new and/or changed development factors
6
Identify external constraints/stimulants
7
Assign factors to affected study areas

FIGURE 3:

LOGIC FLOW CHART

OF LAND USE ANALYSIS

UPDATING

PROCEDURE

The procedure for determining the current zoning and general plan acreages is as follows:

(a) Determine if rezonings (to or from residential zoning) or general plan changes have been made and, in which jurisdiction the changes have occurred (either Morgan Hill, San Jose or county). If no changes have occurred and the densities are as before, this entire step can be omitted. Inquiring at the appropriate planning department is the best means to determine if changes in zoning or the general plan have been made.

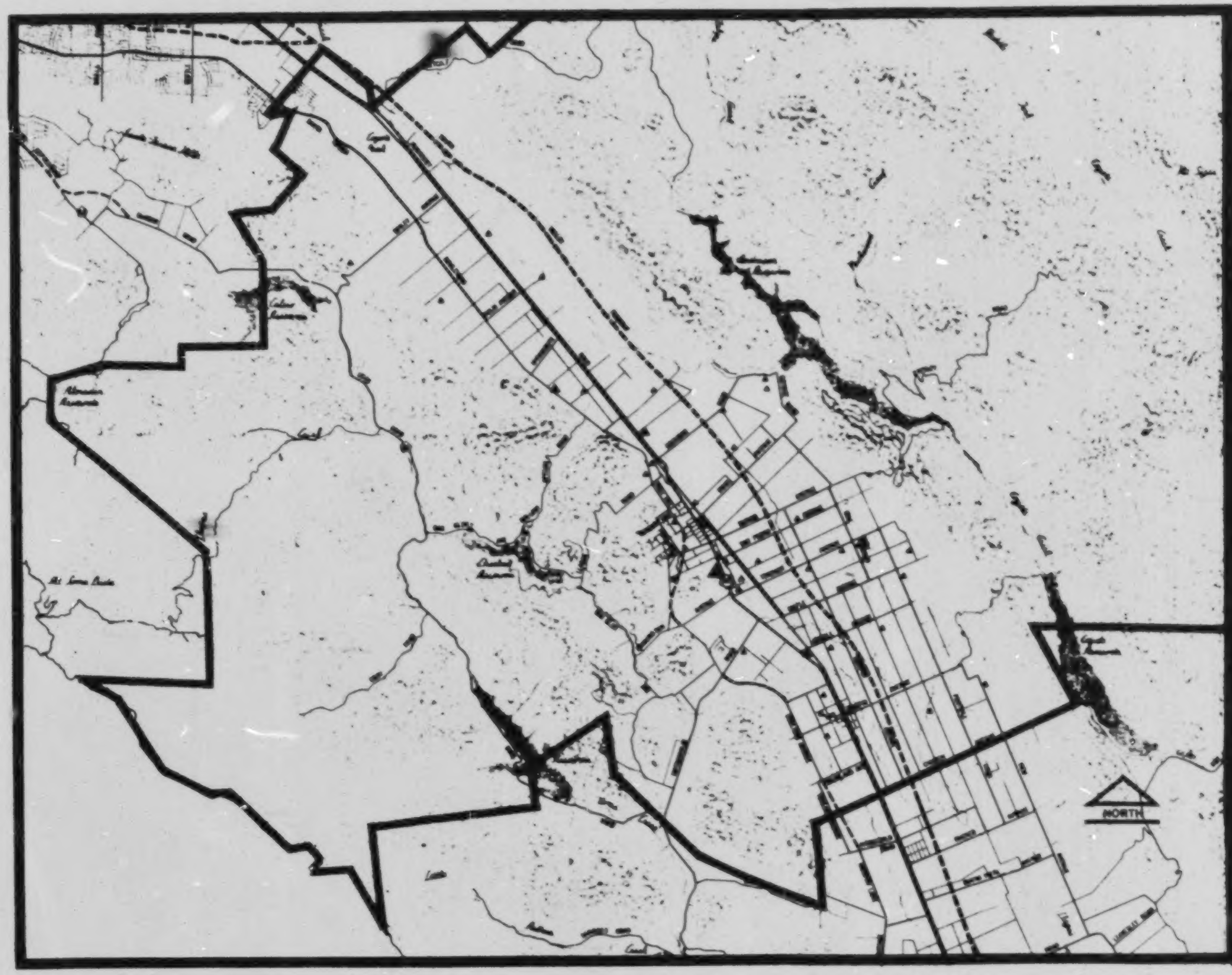
(b) Obtain a copy of the new general plan or zoning map. In the case of Morgan Hill, the entire map appears on one sheet and can be obtained through the planning department. In the case of San Jose and the county the general plan maps can also be obtained at the appropriate planning departments. Zoning changes must be pinpointed in order to obtain the appropriate zoning map since both San Jose and county zoning appear on a series of 500 scale maps arranged in a grid. (A key to these standard maps can be obtained from County Public Works, 1555 Berger Drive, San Jose.) Zoning maps for San Jose are available from San Jose Blue Print Service and Supply Co., 835 W. Julian, San Jose. County zoning maps are available from the County Planning Department.

(c) After determining the location and extent of zoning and general plan changes, determine the number of acres affected by the change. If the shape of the changed area is a rectangle or trapezoid, the acreage can be calculated by measuring the area and using the appropriate formula. If, however, the area of change is irregularly shaped, a planimeter can be used to measure the acreage or a grid sheet can be placed over the area and the number of squares counted. (The size of the squares can be converted into acres at the appropriate map scale and thus the number of acres would be the number of squares multiplied by the acres per square.)

(d) Once the acreage change has been calculated, enter the new value in the appropriate land use category and for the appropriate study area.

2. Step 2 involves determining the number of dwelling units that were actually constructed from the start of the projection period to the present. (This step can be done either concurrently with, or before, step 1.) The first projection provided an estimate of the housing stock as of the end of 1973. The estimate was for the entire district with no distribution by study area. In the event that a census of the district is performed, the number of units in each study area can be determined and this information can be added to the data base. At present, only the increment of new housing units expected in the future and the number of units constructed over the past three years is available by study area.

The new units actually constructed can be determined by using the Harrington Housing Reports which are available for office use at the County Planning Department or the San Jose Planning Department. (The first projection effort utilized the Harrington Reports.) A better procedure, however, would be to obtain the number and location of new units directly from the appropriate city or the county agency. It will be necessary for the district to arrange a formal and continuous reporting procedure if this technique is to be used.



Map No. 11

GENERAL LOCATION of MAJOR ETHNIC CONCENTRATIONS

SPANISH SURNAME POPULATION

- ▲ 10-25 Families
- ▲ 25-50 Families
- ▲ 50-100 Families
- ▲ Over 100 Families

0 2000 8000

Scale (ft)

MASTER PLAN
STUDY - 1974
Morgan Hill Unified
School District
September 1973

Such a procedure is highly recommended since the data would be more accurate, would be obtained more frequently, and would provide more information than is available from Harrington.

In addition to the number and location of units, it is necessary to obtain the acreage that the units cover. If the Harrington Reports are used, this acreage estimate will have to be based on the type of unit constructed. If, on the other hand, the number of units is obtained directly from the city or county, it should be possible to obtain a reasonably accurate land acreage figure, especially in the case of large subdivisions. Moreover, the city or county can provide an estimate of the amount of land taken up for roads and utilities. This information can be used to provide a better estimate of the amount of land to be subtracted for this purpose when the next projection is performed.

The final task in step two is to sum the total amount of land built upon in each study area and subtract the total from the stock of vacant residential land available for future development.

3. Using the information gathered in Step 2, the initial projections must be revised according to actual experience. For example, if it was estimated that 50 new single family units would be constructed in a study area by the end of 1975, but only 40 were actually built, 10 units would be subtracted from each projection made for 1975 (which now becomes the current base), 1980, 1985 and 1990. The projections for the latter three years will be re-examined in the light of current conditions later in the process.

4. Next, an attempt should be made to identify the reasons why the initial projections were off the mark in light of actual units built. Admittedly, if those who update the projections were not involved in the initial study, this appraisal will be difficult. Even though the "critical development factors," upon which most of the projections are based, are documented, the qualitative judgments made on the basis of these factors are not available.

However, it should be possible to assess which factors influenced development. In each study area, these factors may be those initially identified, or, they may be new unforeseen factors. The influential factors might also be intangible "market forces" which produced a demand for housing that the characteristics of the study area satisfied. These too are valid items to document. In short, a cookbook approach cannot be used to prescribe all of the information that must be gathered. In the final analysis, the judgment of the projector must be trusted, since the judgmental approach is at the heart of the forecasting technique used in the study. The extensive data gathering procedure is designed to help the forecaster make the most valid estimates possible.

5. Step 5 repeats the procedure followed during the initial projection which identified those factors which influence the rate and extent of development. The first task in this step is to review the critical factors identified in Table I-K and to determine if these factors are still relevant. If so, the information must be updated to reflect current conditions.

In addition, new factors need to be identified. While there is no prescribed method for accomplishing this task, it may be helpful to review section 1.2.3. Also, see Table I-U for a listing of agencies and individuals who were helpful in obtaining data during the initial study.

Finally, the information gathered in Step 4 must be integrated into the critical development factors. This is the "experience factor"--the reasons why the projections were off the mark. This task, of course, can only be accomplished if some conclusions were reached regarding the inaccuracy of initial projections.

6. Step six involves the identification of "external" constraints/stimulants. In the first projection, this task was not performed in a formal sense. The task involves an assessment of conditions which, while imposed from an area outside the district, would nevertheless have significant impact on development. The boundaries of this "area" might be set at the count level. Examples of these conditions might be regional development policies emanating from ABAG; high interest rates which depress the housing market; fuel shortages which change commuting patterns; or national land use policies which require action at the local level.

If any such factors can be identified, they would probably serve as overall indicators of whether development trends in general will be high or low. Although no formal attempt was made to assess such factors in the initial study, one factor -- the "energy crisis" -- was discussed. While it was obvious that the "energy crisis" would have some effect on future development, Planning Resources Office staff felt that it was impossible to make any meaningful assessment. In the future, however, there may be sufficient data available to justify consideration of this or other factors.

7. Step seven involves assigning factors to study areas. After the "critical development factors" have been identified, they must be assigned to the study areas which they are expected to affect. A tabulation such as used in Table I-K would be a useful means of organizing this information.

In Table I-K, two levels of "significance" are used to assess the impact of development factors on study areas -- a "most significant" and "less significant" measure. This reflects the localized nature of most of the factors identified.

8. Step eight involves estimating future development. At this point, all information collected thus far is used to make a judgment regarding the percentage of vacant land that will be developed in each study area. The procedure followed in this step is to arrange a set of three conditions for each study area which represent high, medium and low rates of growth. (for a better understanding of this procedure, see Tables I-L and I-M). In some cases, there are no factors which correspond to a particular growth rate. In all cases, however, a high, medium and low rate was estimated for each study area in the initial forecast. The "estimates" were made by a Land Use Subcommittee composed of district residents who, because of job or other experience, were knowledgeable about the district's development potential.

TABLE I-U

Information Sources

Critical Development Factor (see 1.2.3)	Agency	Individual/Division*
Oceanic Properties Developments	San Jose Planning Department	Gary Schoenauer
Fisher Creek Improvement	S.C.C. Flood Control and Water District	
South Valley Freeway	San Jose Public Works	
Sewage lines extension	Morgan Hill Public Works; San Jose Public Works	City Engineer Eliot Anderson/Hydraulics
Greater sewage treatment capacity	Gilroy Public Works; Consoer-Townsend, S.J.	City Engineer, Richard Foss
Increased minimum lot size	Santa Clara County Planning Department	Eleanor Young
Annexations	Morgan Hill Planning Dept; S.J. Planning Dept.	Gary Coates
Improved water supply	S.C.C. Flood Control and Water District	Dave Gill
Flood Plain Protection	Santa Clara County Planning Department	
New reservoir	S.C.C. Flood Control and Water District	Dave Gill
Moratorium on septic tanks	Santa Clara County Planning Department	Eleanor Young
Airport Development	Santa Clara County Dept. of Public Works	
Road improvements	Morgan Hill Public Works; San Jose Public Works; S.C.C. Dept. of Public Works	
Industrial development	Morgan Hill and S.J. Planning Departments	
Slope	Santa Clara County Planning Department	Zoning Section

* The individuals specified may change.

9. Step nine involves calculating new dwellings. The information gathered in steps 1 through 8 becomes the input for the Land Use Computer Program, a program, written to facilitate the extensive computations involved in this, the final step. For a detailed explanation of the program, the reader is referred to PROGRAM DOCUMENTATION.

The formulas used in computing the new dwelling units of one type (either single family or multiple family) for one land use pattern (alternatives A, B or C--refer to 1.2.5) in one study area, and for one projection year are as follows.

1. $(A_T) - (A_T) (P_D) = A_V$

   Where A_T = total acres in each land use category for which there is a unique density,
   P_D = percentage of the study area which is estimated to be already developed.
   A_V = acreage available for development

2. $(A_V) - (A_V) (P_S) = A_N$

   Where A_V = acreage available for development
   P_S = percent allotted for streets, utilities, etc.
   A_N = net developable acres

3. $(A) (D) (P_F) = DU$

   Where A_D = net developable acres
   D = density of development (dwelling units per acre)
   P_F = percent of vacant land that will be developed by projection year
   DU = new dwelling units

Each of the three equations above must be repeated for all residential land use categories, growth rates, land use alternatives, study areas, and projection years. Because of the numerous repetitive computations involved, the computer program speeds up the process enormously and allows much greater accuracy.

NOTES FOR TABLES I-V TO I-Z

1. SF - single family
   AR - agriculture-residential
   MF Lo - multiple family, low density
   MF Hi - multiple family, high density
   Hill Dev - hillside and open space development
   Low Den - low density (same as single family)
   Med Den - medium density (multiple family)
   Hi Den - high density (multiple family)

   "Flat" - land located on less than approximately 10% slope
   "Steep" - land located on more than approximately 10% slope

2. See 1.2.5 for detailed explanation of alternatives.

3. Subtraction Factors - assumptions made regarding:
   (1) the amount of land in each study area already built upon; and
   (2) the portion taken up by streets, utilities, etc.

4. Percent of study area already developed as of the end of 1973.

5. Numbers 1 through 22 correspond to Table I-X , Study Area Acreages.

TABLE I-V

Density Assumptions

Study Area	Density (dwelling units per acre) (5)																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	5.5																					
2	7	.4							7	3	.4	.25					.15					
3	7	.4							7	3	.4						.15					
4	7	.4							7		.4					.4	.15			16		
5	7	.4							7		.4	.25										
6	7	.4							7		.4									16		
7	.75	.4							.75		.4	.2				.4	.15			16		
8	.75	.4							.75		.4	.2				.4	.15			16		
9		.2										.2					.15					
10	5	.4							5	1	.4	.2				.4	.15					
11	5								5	1		.2					.15					
12		.4									.4	.2				2	.5					
13		.4									.4	.25				2	.5					
14		.4									.4	.25					.5					
15	5	.4			2				.5							2	.5					
16	7	.4		16	2	5	10									2	.5	5		10		
17		.4			2					3	.4	.25				2	.5					
18		.4			2	5					.4	.25				2	.5	5		10		
19	7	.4		16	2	5	10				.4	.25				2	.5	5		10		
20		.4									.4	.25				2	.5					
21	7	.4				5	10		7		.4							5		10		
22	7	.4		16	2	5	10				.4					2		5		10		
23	7	.4				5	10				.4							5		10		
24	7	.4		16		5	10				.4							5		10		
25	7	.4			2	5	10				.4					2	.5	5		10		
26	7	.4		16	2	5	10									2	.5	5		10		
27	2	.4		20	2	5					.4	.25				2	.5	5				
28		.4			2						.4	.25				2	.5					
29												.2					.5					

TABLE I-W

Subtraction Factors (3)

Study Area	(4) % Already Developed	Percent Subtracted for Streets, Utilities, Etc. (5)																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	.40	.2																					
2	.02	.2	.15							.2	.2	.15	.15					.15					
3	.03	.2	.15							.2	.2	.15						.15					
4	.10	.2	.15							.2		.15					.15	.15			.15		
5	.10	.2	.15							.2		.15	.15										
6	.05	.2	.15							.2		.15									.15		
7	0.0	.2	.15							.2		.15	.15				.15	.15			.15		
8	0.0	.2	.15							.2		.15	.15				.15	.15			.15		
9	0.001		.15										.15					.15					
10	0.005	.2	.15							.2	.2	.15	.15				.15	.15					
11	0.0	.2								.2	.2		.15					.15					
12	0.01		.15									.15	.15				.15	.15					
13	0.01		.15									.15	.15				.15	.15					
14	0.20		.15									.15	.15					.15					
15	0.15	.2	.15			.15				.2							.15	.15					
16	0.20	.2	.15		.15	.15	.15	.10									.15	.15	.15		.10		
17	0.25		.15			.15					.15	.15	.15				.15	.15					
18	0.20		.15			.15	.15					.15	.15				.15	.15	.15		.10		
19	0.25	.2	.15		.15	.15	.15	.10				.15	.15				.15	.15	.15		.10		
20	0.50		.15									.15	.15				.15	.15					
21	0.10	.2	.15				.15	.10		.2		.15							.15		.10		
22	0.10	.2	.15		.15	.15	.15	.10				.15					.15		.15		.10		
23	0.10	.2	.15				.15	.10				.15							.15		.10		
24	0.10	.2	.15		.15		.15	.10				.15							.15		.10		
25	0.15	.2	.15			.15	.15	.10				.15					.15	.15	.15		.10		
26	0.65	.2	.15		.15	.15	.15	.10									.15	.15	.15		.10		
27	0.15	.10	.15		.10	.15	.15					.15	.15				.15	.15	.15				
28	0.05		.15			.15						.15	.15				.15	.15					
29	0.0												.15					.15					

TABLE I-X

Study Area Acreages (1)

Morgan Hill Unified School District

		ALTERNATIVE "A" (2)				ALTERNATIVE "B" (2)										
		Zoning				General Plan				Zoning						
Study Area	Total Acres	SF 1	AR 2	MF LO 3	MF HI 4	HillDev 5	LowDen 6	MedDen 7	Hi Den 8	SF Flat 9	SFSteep 10	AR Flat 11	ARSteep 12	MF Low Flat 13	MF Low Steep 14	MF Hi 15
1	1565	500														
2	2950	1650	270							1650	735	270	150			
3	1935	30	1635							30	170	1635				
4	1470	25	875							25		875				
5	2180	450	1615							450		1615	65			
6	1390	600	790							600		790				
7	7130	4000	530							4000		530	2600			
8	10640	3350	220							3350		220	5110			
9	46600	6000								6000						
10	5800	610	330							610	2300	330	940			
11	6350	175								175	2425		2840			
12	4640		685									685	1715			
13	12000		1085									1085	7960			
14	9800		285									285	8465			
15	725	140	345			630				155						
16	1035	180	295		15	680	135	55								
17	2215		500			190					20	500	340			
18	855		700			190	370					120	80			
19	2320	385	680		5	50	540	300				420	165			
20	4000		1800									1800	1380			
21	5850	15	4065				490	85		9		3600				
22	2035	85	485		20	45	715	345				20				
23	1095	345	430				300	430				25				
24	2070	180	1040		100		575	600				25				
25	2170	255	1165			160	200	340				250				
26	1750	750	200		220	430	40	405								
27	3460	665	1500		35	1400	65					1235	470			
28	3620		275			110						1235	470			
29	46600											20000				

TABLE I-Y
(cont.)

Study Area Acreages

Study Area	ALTERNATIVE "C" (2)					
		General Plan				
	HillDev Flat 16	HillDev Steep 17	LowDen Flat 18	LowDen Steep 19	MedDen Flat 20	MedDen Steep 21
1						
2		450				
3		190				
4	90	490			130	
5						
6					500	
7	2520	800			60	
8	2425	2740			130	
9		44450				
10	575	2770				
11		6000				
12	420	2800				
13	1100	7600				
14		4950				
15	420	180				
16	620	225	135		55	
17	1090	1025				
18	190	120	270		60	
19	200	210	780		300	
20	750	85				
21			3650		465	
22	45		875		445	
23			380		430	
24			640		600	
25	140	300	200		340	
26	290	140	40		405	
27	1670	400	300			
28	600	2300				
29		34600				

TABLE I-Z
Summary of Vacant to be Developed (%)
(Refer to Tables I-L and I-M)

1975			1980			1985			1990		
Low	Med	Hi	Low	Med	Hi	Low	Med	Hi	Low	Med	Hi
15	40	100	80	100	100	100	100	100	100	100	100
0	0	0	2	5	20	10	30	50	20	60	100
0	0	0	2	5	10	12	20	22	25	35	35
0	0	0	2	7	10	12	15	22	25	25	35
1	2	2	5	30	45	20	50	75	40	90	90
0	0	0	0	0	7	8	8	25	20	20	50
0	0	0	0	0	2	5	5	10	10	10	30
0	0	0	2	2	0	2	2	2	5	5	10
0	0	0	0	1	5	0	5	1	5	1	2
0	0	0	5	5	5	20	20	25	75	75	80
0	0	0	0	0	2	2	2	7	10	10	12
1	1	1	2	2	2	3	4	10	4	7	20
1	1	1	2	2	3	3	4	7	4	6	12
1	1	1	1	1	2	2	2	3	2	3	4
5	5	10	10	15	30	20	25	40	30	40	70
5	5	7	8	15	25	10	25	60	12	35	90
5	5	5	11	15	50	11	40	100	11	100	100
5	5	5	8	20	50	10	50	100	12	75	100
10	10	10	20	25	35	30	35	100	30	35	100
5	5	5	8	10	20	10	20	40	12	30	65
5	5	5	7	15	20	15	30	40	25	40	60
5	5	5	8	15	20	10	25	40	12	40	60
10	15	15	20	30	40	30	50	75	40	75	100
2	5	5	7	20	25	12	35	50	25	50	60
2	5	5	7	15	20	12	30	40	20	40	50
5	10	15	10	25	30	15	45	60	20	60	100
5	5	10	15	25	35	25	40	60	35	65	90
0	2	2	1	5	7	2	8	15	3	11	25
0	0	0	0	0	5	0	5	1	5	1	2

Addendum to ENSIM

Research Report Number Eleven
Project Simu School:
Santa Clara County Component

(Insert following page 105)

Projected enrollments, by study area, by grade level, were inadvertantly omitted from the Morgan Hill Case Study, Appendix A. These projections, which comprise the output of ENSIM in the Morgan Hill project, are provided on the following pages.

TABLE III-B
MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL
ALTERNATIVE A FOR 1975

STUDY	GRADES K-5			GRADES 6-8			GRADES 9-12			GRADES K-12		
AREA	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH
1	107	283	727	38	99	255	33	86	221	178	468	1203
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	15	31	31	5	11	11	5	9	9	25	51	51
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	2	2	2	1	1	1	1	1	1	4	4	4
13	2	2	2	1	1	1	1	1	1	4	4	4
14	1	1	1	0	0	0	0	0	0	1	1	1
15	4	4	9	1	1	3	1	1	3	6	6	15
16	28	28	37	10	10	13	9	9	11	47	47	61
17	3	3	3	1	1	1	1	1	1	5	5	5
18	5	5	5	2	2	2	2	2	2	9	9	9
19	102	102	102	36	36	36	31	31	31	169	169	169
20	17	17	17	6	6	6	5	5	5	28	28	28
21	39	39	39	14	14	14	12	12	12	65	65	65
22	20	20	20	7	7	7	6	6	6	33	33	33
23	102	158	158	36	55	55	31	48	48	169	261	261
24	11	23	23	4	8	8	3	7	7	18	38	38
25	12	41	41	4	14	14	4	12	12	20	67	67
26	156	315	476	53	107	162	47	96	144	256	518	782
27	49	49	98	17	17	34	15	15	30	81	81	162
28	0	1	1	0	0	0	0	0	0	0	1	1
29	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	675	1124	1792	236	390	623	207	342	544	1118	1856	2959

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TABLE III- C
MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL

ALTERNATIVE B FOR 1975

STUDY AREA	GRADES K-5 LOW	GRADES K-5 MED	GRADES K-5 HIGH	GRADES 6-8 LOW	GRADES 6-8 MED	GRADES 6-8 HIGH	GRADES 9-12 LOW	GRADES 9-12 MED	GRADES 9-12 HIGH	GRADES K-12 LOW	GRADES K-12 MED	GRADES K-12 HIGH
1	107	283	727	38	99	255	33	86	221	178	468	1203
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	15	29	29	5	10	10	4	9	9	24	48	48
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	3	3	3	1	1	1	1	1	1	5	5	5
13	14	14	14	5	5	5	4	4	4	23	23	23
14	2	2	2	1	1	1	1	1	1	4	4	4
15	33	33	66	12	12	23	10	10	20	55	55	109
16	45	45	59	16	16	21	14	14	18	75	75	98
17	14	14	14	5	5	5	4	4	4	23	23	23
18	46	46	46	16	16	16	14	14	14	76	76	76
19	158	158	158	53	53	53	48	48	48	259	259	259
20	23	23	23	8	8	8	7	7	7	38	38	38
21	93	93	93	32	32	32	28	28	28	153	153	153
22	110	110	110	37	37	37	33	33	33	180	180	180
23	154	218	218	50	71	71	47	66	66	251	355	355
24	47	115	115	15	38	38	14	35	35	76	188	188
25	21	42	42	7	13	13	6	13	13	34	68	68
26	23	49	72	7	16	23	7	15	22	37	80	117
27	35	85	172	30	30	60	26	26	52	141	141	294
28	0	8	8	0	3	3	0	2	2	0	13	13
29	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	993	1370	1971	338	466	675	301	416	598	1632	2252	3244

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TABLE III-D

MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL

ALTERNATIVE C FOR 1975

STUDY AREA	GRADES K-5 LOW	GRADES K-5 MED	GRADES K-5 HIGH	GRADES 6-8 LOW	GRADES 6-8 MED	GRADES 6-8 HIGH	GRADES 9-12 LOW	GRADES 9-12 MED	GRADES 9-12 HIGH	GRADES K-12 LOW	GRADES K-12 MED	GRADES K-12 HIGH
1	107	283	727	38	99	255	33	86	221	178	468	1203
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	11	11	11	4	4	4	3	3	3	18	18	18
13	31	31	31	11	11	11	9	9	9	51	51	51
14	0	0	0	0	0	0	0	0	0	0	0	0
15	22	22	43	8	8	15	7	7	13	37	37	71
16	38	38	67	13	13	23	12	12	20	63	63	110
17	29	29	29	10	10	10	9	9	9	48	48	48
18	50	50	50	17	17	17	15	15	15	82	82	82
19	201	201	201	68	68	68	61	61	61	330	330	330
20	19	19	19	7	7	7	6	6	6	32	32	32
21	417	417	417	144	144	144	127	127	127	688	688	688
22	139	139	139	47	47	47	42	42	42	228	228	228
23	162	243	243	53	79	79	49	74	74	264	396	396
24	53	124	124	17	41	41	16	38	38	86	203	203
25	18	55	55	6	18	18	6	17	17	30	90	90
26	21	45	67	7	14	21	6	14	20	34	73	108
27	111	111	221	39	39	77	34	34	67	184	184	365
28	0	21	21	0	7	7	0	6	6	0	34	34
29	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1429	1839	2465	489	626	844	435	560	748	2353	3025	4057

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TABLE III-E

MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL

ALTERNATIVE A FOR 1980

STUDY	GRADES K-5			GRADES 6-8			GRADES 9-12			GRADES K-12		
AREA	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH
1	567	727	727	199	255	255	172	221	221	938	1203	1203
2	104	256	1034	37	90	363	32	78	314	173	424	1711
3	10	19	38	3	7	13	3	6	12	16	32	63
4	7	19	23	2	7	8	2	6	7	11	32	38
5	77	469	705	27	165	248	23	142	214	127	776	1167
6	0	0	137	0	0	48	0	0	42	0	0	227
7	0	0	33	0	0	12	0	0	10	0	0	55
8	0	1	0	0	0	0	0	0	0	0	1	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	71	71	0	25	25	0	21	21	0	117	117
11	0	0	9	0	0	3	0	0	3	0	0	15
12	3	3	4	1	1	1	1	1	1	5	5	6
13	4	4	6	1	1	2	1	1	2	6	6	10
14	1	1	4860	0	0	1480	0	0	1480	1	1	7820
15	9	12	26	3	4	9	3	4	8	15	20	43
16	42	80	136	15	28	47	13	24	41	70	132	224
17	8	11	36	3	4	13	2	3	11	13	18	60
18	9	22	54	3	8	19	3	7	16	15	37	89
19	206	258	359	72	91	126	62	78	109	340	427	594
20	27	33	66	10	12	23	8	10	20	45	55	109
21	53	109	149	19	38	52	16	33	45	88	180	246
22	26	56	76	9	19	26	8	17	23	43	92	125
23	205	316	422	72	111	148	62	96	128	339	523	698
24	21	98	123	6	31	39	6	30	37	33	159	199
25	61	132	173	21	46	61	18	40	52	100	218	286
26	315	795	955	107	270	325	96	241	290	518	1306	1570
27	147	243	343	51	84	118	45	74	104	243	401	565
28	5	2	3	2	1	1	1	1	1	8	4	5
29	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1507	3737	10568	663	1298	3465	577	1134	3212	3147	6169	17245

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TABLE III-F

MORGAN HILL UNIFIED SCHOOL DISTRICT

PROJECTED/NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL

ALTERNATIVE B FOR 1980

STUDY	GRADES K-5			GRADES 6-8			GRADES 9-12			GRADES K-12		
AREA	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH
1	567	727	727	199	255	255	172	221	221	938	1203	1203
2	124	306	1230	43	107	432	37	93	373	204	506	2035
3	15	31	60	5	11	21	4	9	18	24	51	99
4	54	197	281	19	69	99	17	60	85	90	326	465
5	77	471	709	27	165	249	23	143	215	127	779	1173
6	0	0	137	0	0	48	0	0	42	0	0	227
7	0	0	39	0	0	14	0	0	12	0	0	65
8	0	14	0	0	5	0	0	4	0	0	23	0
9	0	1	3	0	0	1	0	0	1	0	1	5
10	0	132	132	0	46	46	0	40	40	0	218	218
11	0	0	38	0	0	13	0	0	12	0	0	63
12	10	10	10	3	3	4	3	3	3	16	16	17
13	24	24	39	9	9	14	7	7	12	40	40	65
14	11	11	11	4	4	4	3	3	3	18	18	18
15	65	98	197	23	34	69	20	30	60	108	162	326
16	70	133	220	24	46	76	21	40	67	115	219	363
17	32	42	142	11	15	50	10	13	43	53	70	235
18	64	176	443	22	62	156	19	53	135	105	291	734
19	317	658	931	107	225	319	96	200	283	520	1083	1533
20	39	49	98	14	17	34	12	15	30	65	81	162
21	128	272	172	44	94	59	39	83	52	211	449	283
22	174	327	462	58	110	156	53	99	140	285	536	758
23	293	435	586	95	141	190	89	132	178	477	708	954
24	165	472	587	54	155	192	50	143	178	269	770	957
25	83	177	237	27	58	77	25	54	72	135	289	386
26	49	123	144	15	39	46	15	37	44	80	199	234
27	257	429	603	90	150	212	78	130	183	425	709	998
28	3	16	23	1	6	8	1	5	7	5	27	38
29	0	0	11	0	0	4	0	0	3	0	0	18
TOTAL	2621	5331	8272	895	1826	2848	794	1617	2512	4310	8774	13632

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TABLE III-G
MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL

ALTERNATIVE C FOR 1980

STUDY	GRADES K-5			GRADES 6-8			GRADES 9-12			GRADES K-12		
AREA	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH
1	567	727	727	199	255	255	172	221	221	938	1203	1203
2	1	2	6	0	1	2	0	1	2	1	4	10
3	0	1	1	0	0	0	0	0	0	0	1	1
4	8	31	44	3	9	14	3	9	13	14	49	71
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	11	0	0	4	0	0	3	0	0	18
8	0	13	0	0	5	0	0	4	0	0	22	0
9	0	4	19	0	1	7	0	1	6	0	6	32
10	0	24	24	0	8	8	0	7	7	0	39	39
11	0	0	9	0	0	3	0	0	3	0	0	15
12	22	22	32	8	8	11	7	7	10	37	37	53
13	62	62	95	22	22	33	19	19	29	103	103	157
14	12	12	12	4	4	4	4	4	4	20	20	20
15	43	66	132	15	23	46	13	20	40	71	109	218
16	67	132	219	23	46	76	20	40	67	110	218	362
17	107	146	290	37	51	102	32	44	88	176	241	480
18	77	194	490	27	67	170	23	59	149	127	320	809
19	402	499	702	137	170	238	122	152	213	661	821	1153
20	29	36	73	10	13	26	9	11	22	48	60	121
21	585	1253	1673	202	433	579	177	380	508	964	2066	2760
22	227	420	563	76	141	189	69	128	171	372	689	923
23	326	485	652	107	159	213	99	147	198	532	791	1063
24	173	497	620	57	153	204	53	151	188	283	811	1012
25	180	453	596	62	147	195	55	138	181	297	738	972
26	45	112	134	14	36	43	14	34	41	73	182	218
27	333	431	775	117	151	272	101	131	235	551	713	1282
28	11	53	79	4	19	28	3	16	24	18	88	131
29	0	0	49	0	0	17	0	0	15	0	0	81
TOTAL	3277	5675	8027	1124	1932	2739	995	1724	2438	5396	9331	13204

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TABLE III-H
MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED/ENROLLMENT BY STUDY AREA BY GRADE LEVEL
NEW
ALTERNATIVE A FOR 1985

STUDY	GRADES K-5			GRADES 6-8			GRADES 9-12			GRADES K-12		
AREA	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH
1	727	727	727	255	255	255	221	221	221	1203	1203	1203
2	517	1555	2593	181	546	910	157	472	787	855	2573	4290
3	44	81	87	16	28	30	13	24	26	73	133	143
4	26	35	49	9	12	17	8	10	15	43	57	81
5	314	783	1175	110	275	412	95	238	356	519	1296	1943
6	0	154	489	0	54	172	0	47	148	0	255	809
7	0	82	163	0	29	57	0	25	50	0	136	270
8	0	27	27	0	10	10	0	8	8	0	45	45
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	287	358	0	101	126	0	87	109	0	475	593
11	0	9	26	0	3	9	0	3	8	0	15	43
12	4	5	13	1	2	5	1	2	4	6	9	22
13	6	9	15	2	3	5	2	3	4	10	15	24
14	1	1	1	0	0	0	0	0	0	1	1	1
15	17	21	34	6	7	12	5	6	10	28	34	56
16	58	137	327	20	48	113	18	42	99	96	227	539
17	8	29	73	3	10	25	2	9	22	13	48	120
18	10	54	108	4	19	38	3	16	33	17	89	179
19	307	359	1917	108	126	672	93	109	581	508	594	3170
20	33	66	132	12	23	46	10	20	40	55	109	218
21	109	223	298	38	78	104	33	68	90	180	369	492
22	36	88	144	12	31	50	11	27	44	59	146	238
23	316	524	794	111	184	279	96	159	241	523	867	1314
24	57	172	246	18	55	79	17	52	75	92	279	400
25	102	263	350	36	92	123	31	80	106	169	435	579
26	476	1435	1915	162	487	651	144	436	581	782	2358	3147
27	243	389	583	84	134	201	74	118	177	401	641	961
28	1	3	7	0	1	3	0	1	2	1	5	12
29	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	3412	7518	12651	1188	2613	4404	1034	2283	3837	5634	12414	20892

TABLE III-I
MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL

ALTERNATIVE B FOR 1985

STUDY AREA	GRADES K-5 LOW	MED	HIGH	GRADES 6-8 LOW	MED	HIGH	GRADES 9-12 LOW	MED	HIGH	GRADES K-12 LOW	MED	HIGH
1	727	727	727	255	255	255	221	221	221	1203	1203	1203
2	616	1854	3093	216	651	1086	187	562	938	1019	3067	5117
3	71	125	136	25	44	48	22	38	41	118	207	225
4	26	35	49	9	12	17	8	10	15	43	57	81
5	315	786	1180	111	276	414	96	239	358	522	1301	1952
6	0	154	489	0	54	172	0	47	148	0	255	809
7	0	97	194	0	34	68	0	29	59	0	160	321
8	0	40	40	0	14	14	0	12	12	0	66	66
9	0	3	7	0	1	2	0	1	2	0	5	11
10	0	530	662	0	186	232	0	161	201	0	877	1095
11	0	38	131	0	13	46	0	12	40	0	63	217
12	10	16	33	4	6	12	3	5	10	17	27	55
13	39	52	91	14	18	32	12	16	28	65	86	151
14	22	22	31	8	8	11	7	7	9	37	37	51
15	132	164	515	46	58	181	40	50	156	218	272	852
16	61	220	528	21	76	183	19	67	160	101	363	871
17	32	114	286	11	40	100	10	35	87	53	189	473
18	88	448	887	31	157	311	27	136	269	146	741	1467
19	475	555	1583	160	187	533	144	168	481	779	910	2597
20	57	114	222	20	40	78	17	35	67	94	189	367
21	272	545	729	94	189	253	83	165	221	449	899	1203
22	217	544	873	73	183	294	66	165	265	356	892	1432
23	435	731	1097	141	237	356	132	222	333	708	1190	1786
24	283	826	1180	93	271	387	86	251	359	462	1348	1926
25	142	358	224	46	117	78	43	109	68	231	584	370
26	72	221	291	23	71	94	22	67	89	117	359	474
27	429	687	1033	150	241	362	130	208	313	709	1136	1708
28	8	30	57	3	11	20	2	9	17	13	50	94
29	0	11	23	0	4	8	0	3	7	0	18	38
TOTAL	4529	10047	16391	1554	3454	5647	1377	3050	4974	7460	16551	27012

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TABLE III- J

MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL

ALTERNATIVE C FOR 1985

STUDY	GRADES K-5			GRADES 6-8			GRADES 9-12			GRADES K-12		
AREA	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH
1	727	727	727	255	255	255	221	221	221	1203	1203	1203
2	3	10	16	1	3	6	1	3	5	5	16	27
3	2	2	3	1	1	1	1	1	1	4	4	5
4	52	65	96	16	20	30	16	20	29	84	105	155
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	132	412	0	40	126	0	40	126	0	212	664
7	0	17	35	0	6	11	0	5	11	0	28	57
8	0	21	21	0	7	7	0	6	6	0	34	34
9	0	19	37	0	7	13	0	6	11	0	32	61
10	0	315	393	0	110	138	0	95	119	0	520	650
11	0	9	31	0	3	11	0	3	9	0	15	51
12	23	30	77	8	11	27	7	9	23	38	50	127
13	95	126	221	33	44	77	29	38	67	157	208	365
14	24	24	36	8	8	13	7	7	11	39	39	60
15	47	59	117	17	21	41	14	18	35	78	98	193
16	87	219	527	30	76	182	26	67	160	143	362	869
17	64	455	1530	22	160	537	19	138	464	105	753	2531
18	98	492	984	34	170	340	30	149	299	162	811	1623
19	597	702	2003	203	238	680	181	213	608	981	1153	3291
20	71	142	285	25	50	100	21	43	86	117	235	471
21	1253	2509	3344	433	868	1157	380	761	1015	2066	4138	5516
22	281	702	1126	94	236	379	85	213	342	460	1151	1847
23	485	811	1215	159	265	397	147	247	369	791	1323	1981
24	297	870	1243	98	286	409	90	264	378	485	1420	2030
25	142	358	452	46	117	147	43	109	137	231	584	736
26	67	204	270	21	65	86	20	62	82	108	331	438
27	554	887	1330	194	311	467	168	269	403	916	1467	2200
28	21	86	162	7	30	57	6	26	49	34	142	268
29	0	49	98	0	17	34	0	15	30	0	81	162
TOTAL	4590	10042	16791	1705	3425	5728	1512	3048	5096	8207	16515	27615

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TABLE III-K

MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED/NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL

ALTERNATIVE A FOR 1990

STUDY	GRADES K-5			GRADES 6-8			GRADES 9-12			GRADES K-12		
AREA	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH
1	727	727	727	255	255	255	221	221	221	1203	1203	1203
2	1034	3111	5187	363	1092	1820	314	944	1573	1711	5147	8580
3	100	138	138	35	49	49	30	42	42	165	229	229
4	54	54	77	19	19	27	16	16	23	89	89	127
5	628	1411	1411	220	495	495	191	428	428	1039	2334	2334
6	0	386	978	0	136	343	0	117	297	0	639	1618
7	0	163	490	0	57	172	0	50	149	0	270	811
8	0	67	134	0	24	47	0	20	41	0	111	222
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	1076	1148	0	378	403	0	326	349	0	1780	1899
11	0	40	45	0	14	16	0	12	14	0	66	75
12	5	9	26	2	3	9	2	3	8	9	15	43
13	9	12	25	3	4	9	3	4	8	15	20	42
14	1	1	2	0	0	1	0	0	1	1	1	4
15	26	34	59	9	12	21	8	10	18	43	56	98
16	69	519	1045	24	182	365	21	158	317	113	859	1727
17	8	73	73	3	25	25	2	22	22	13	120	120
18	12	81	108	4	28	38	4	24	33	20	133	179
19	307	359	1917	108	126	672	93	109	581	508	594	3170
20	39	99	214	14	35	75	12	30	65	65	164	354
21	188	295	447	66	103	157	57	89	136	311	487	740
22	40	152	232	14	52	80	12	46	71	66	250	383
23	422	1110	1063	148	390	373	128	337	322	698	1837	1758
24	123	246	367	39	79	120	37	75	112	199	400	599
25	173	350	441	61	123	155	52	106	134	286	579	730
26	640	1915	3190	217	651	1084	194	581	969	1051	3147	5243
27	343	635	879	118	218	302	104	193	267	565	1046	1448
28	1	5	12	0	2	4	0	2	4	1	9	20
29	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	4943	13068	20435	1722	4552	7117	1501	3965	6204	8171	21585	33756

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TABLE III-L
MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED NEW ENROLLMENT BY STUDY AREA BY GRADE LEVEL

ALTERNATIVE B FOR 1990

STUDY	GRADES K-5			GRADES 6-8			GRADES 9-12			GRADES K-12		
AREA	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH	LOW	MED	HIGH
1	727	727	727	255	255	255	221	221	221	1203	1203	1203
2	1233	3710	6179	433	1302	2169	374	1125	1874	2040	6137	10222
3	156	217	217	55	76	76	47	66	66	258	359	359
4	54	54	77	19	19	27	17	17	23	90	90	127
5	631	1417	1417	221	497	497	191	430	430	1043	2344	2344
6	0	386	978	0	136	343	0	117	297	0	639	1618
7	0	1282	584	0	450	205	0	389	177	0	2121	966
8	0	98	196	0	34	69	0	30	59	0	162	324
9	3	7	14	1	2	5	1	2	4	5	11	23
10	0	1989	2121	0	698	744	0	603	643	0	3290	3508
11	0	156	185	0	55	65	0	47	56	0	258	306
12	13	23	67	5	8	23	4	7	20	22	38	110
13	52	78	156	18	27	55	16	24	47	86	129	258
14	22	31	43	8	11	15	7	9	13	37	51	71
15	197	263	466	69	92	163	60	80	141	326	435	770
16	106	308	795	37	107	275	32	94	241	175	509	1311
17	32	286	286	11	100	100	10	87	87	53	473	473
18	105	665	887	37	233	311	32	202	269	174	1100	1467
19	475	555	1583	160	187	533	144	168	481	779	910	2597
20	58	145	317	20	51	111	18	44	96	96	241	524
21	454	729	1112	157	253	386	138	221	337	749	1203	1835
22	262	873	1378	88	294	465	80	265	418	430	1432	2261
23	586	1097	1463	190	356	474	178	333	445	954	1786	2382
24	587	1180	1415	192	387	464	178	359	430	957	1926	2309
25	237	486	591	77	159	193	72	148	180	386	793	964
26	102	291	415	33	94	131	31	89	126	166	474	672
27	603	1119	1550	212	393	544	183	340	470	998	1852	2564
28	11	71	163	4	25	57	3	22	50	18	118	270
29	11	23	45	4	8	16	3	7	14	18	38	75
TOTAL	6717	19267	25427	2306	6309	8771	2040	5546	7715	11063	30122	41913

TABLE III-M
MORGAN HILL UNIFIED SCHOOL DISTRICT
PROJECTED/ENROLLMENT BY STUDY AREA BY GRADE LEVEL
NEW
ALTERNATIVE C FOR 1990

STUDY AREA	GRADES K-5 LOW	MED	HIGH	GRADES 6-8 LOW	MED	HIGH	GRADES 9-12 LOW	MED	HIGH	GRADES K-12 LOW	MED	HIGH
1	727	727	727	255	255	255	221	221	221	1203	1203	1203
2	6	19	32	2	7	11	2	6	10	10	32	53
3	3	5	5	1	2	2	1	1	1	5	8	8
4	109	109	153	34	34	47	33	33	47	176	176	247
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	330	824	0	101	251	0	101	251	0	532	1326
7	0	75	224	0	25	76	0	23	68	0	123	368
8	0	52	109	0	17	36	0	15	33	0	85	178
9	37	75	150	13	26	53	11	23	45	61	124	248
10	0	234	257	0	82	90	0	71	78	0	387	425
11	0	43	52	0	15	18	0	13	16	0	71	86
12	42	75	179	15	26	63	13	23	54	70	124	296
13	126	190	315	44	67	111	38	58	96	208	315	522
14	24	36	48	8	13	17	7	11	14	39	60	79
15	75	175	304	26	61	107	23	53	92	124	289	503
16	106	286	792	37	100	274	32	87	240	175	473	1306
17	64	1530	1530	22	537	537	19	464	464	105	2531	2531
18	116	737	984	40	255	340	35	224	299	191	1216	1623
19	597	702	2003	203	238	680	181	213	608	981	1153	3291
20	85	211	235	30	74	83	26	64	71	141	349	389
21	2006	3344	5020	693	1157	1736	609	1015	1523	3308	5516	8279
22	336	1126	1634	113	379	567	102	342	512	551	1847	2763
23	652	1215	1622	213	397	530	198	369	493	1063	1981	2645
24	620	1243	1495	204	409	492	188	378	454	1012	2030	2441
25	180	453	596	62	147	195	55	138	181	297	738	972
26	98	270	453	32	86	144	30	82	138	160	438	735
27	775	1442	1996	272	506	701	235	437	606	1282	2385	3303
28	33	118	269	12	41	94	10	36	82	55	195	445
29	49	98	195	17	34	68	15	30	59	81	162	322

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TABLE III-N
Projected Total Enrollments by Study Area
"Most Likely" Development Pattern

Study	1976			1981			1986			1991		
Area	K-5	6-8	9-12	K-5	6-8	9-12	K-5	6-8	9-12	K-5	6-8	9-12
1	657	227	185	1,101	383	320	1,101	383	320	1,101	383	320
2	20	9	7	124	46	39	537	190	164	1,054	372	321
3	25	16	13	63	29	25	112	46	39	163	65	55
4	70	35	30	89	42	36	105	47	40	124	54	46
5	31	25	17	733	262	222	1,203	426	364	1,439	509	436
6	10	12	11	147	60	53	499	184	159	988	355	308
7	0	0	0	0	0	0	82	29	25	163	57	50
8	7	4	3	8	4	3	34	14	11	74	28	23
9	0	0	0	0	0	0	0	0	0	0	0	0
10	21	10	3	92	45	24	287	105	87	1,097	388	329
11	0	3	3	0	3	3	9	6	6	40	17	15
12	33	30	6	54	37	13	99	53	26	201	89	57
13	55	36	25	86	47	35	150	69	44	214	92	74
14	0	0	2	12	4	6	24	8	9	36	13	13
15	18	8	12	23	10	14	31	13	16	40	16	19
16	123	56	55	275	109	102	583	215	195	848	307	275
17	55	30	31	88	42	61	125	54	72	125	54	72
18	69	31	70	86	34	64	118	45	73	145	54	91
19	299	160	122	799	332	274	696	294	242	696	294	242
20	20	10	18	36	16	23	69	27	33	102	39	43
21	522	321	301	592	345	322	706	385	357	778	410	378
22	225	108	89	649	250	218	1,212	440	389	1,734	628	559
23	282	107	110	691	241	234	1,254	425	405	1,661	558	475
24	190	93	75	547	210	183	901	326	291	1,255	442	399
25	229	112	91	364	157	132	545	216	187	673	258	226
26	644	372	370	718	395	392	816	427	422	886	450	444
27	376	175	161	931	371	330	1,487	566	498	2,155	801	702
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
Total (District)	3,980	1,990	1,810	8,308	3,474	3,229	12,785	5,013	4,475	17,792	6,738	5,972
Total K-12		7,780			15,010			22,272			30,502	

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APPENDIX B

DATA INPUT FORMS

Program 1

Land Yield

CARD 1 - Title Card

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CARD 2 - Control Card

NCAT	NTYPE	NAREA	NYEARS	TPUNCH	NCODE
☐☐	☐☐	☐☐	☐☐	☐☐	☐☐☐☐☐☐☐☐☐☐☐☐

CARD 3 - Dwelling Type Names

Dwelling Type 1	Dwelling Type 2
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐	☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Dwelling Type 3	**Dwelling Type 4**
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐	☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐
Dwelling Type 5	
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐	

CARD 4 - Card 7 Format

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CARD 5 - Card 8 Format

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CARD 6 - Card 9 Format

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CARD 7 - Available Acres

		Total Acres by Land Category (Acre)											
Study Area	Dev	1	2	3	4	5	6	7	8	9	10	11	12
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

CARD 7 - Available Acres (cont.)

		Total Acres by Land Category (Acre)											
Study Area	Dev	1	2	3	4	5	6	7	8	9	10	11	12
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													

CARD 8 - Streets and Utilities

	Percentage of Land Allocated to Streets and Utilities by Land Category (street)											
Study Area	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

CARD 8 - Streets and Utilities (cont.)

	Percentage of Land Allocated to Streets and Utilities by Land Category (street)											
Study Area	1	2	3	4	5	6	7	8	9	10	11	12
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

CARD 9 - Density

Density of Future Construction by Land Category (DENSIT)

Study Area	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

CARD 9 - Density (cont.)

Density of Future Construction by Land Category (DENSIT)

Study Area	1	2	3	4	5	6	7	8	9	10	11	12
16	____	____	____	____	____	____	____	____	____	____	____	____
17	____	____	____	____	____	____	____	____	____	____	____	____
18	____	____	____	____	____	____	____	____	____	____	____	____
19	____	____	____	____	____	____	____	____	____	____	____	____
20	____	____	____	____	____	____	____	____	____	____	____	____
21	____	____	____	____	____	____	____	____	____	____	____	____
22	____	____	____	____	____	____	____	____	____	____	____	____
23	____	____	____	____	____	____	____	____	____	____	____	____
24	____	____	____	____	____	____	____	____	____	____	____	____
25	____	____	____	____	____	____	____	____	____	____	____	____
26	____	____	____	____	____	____	____	____	____	____	____	____
27	____	____	____	____	____	____	____	____	____	____	____	____
28	____	____	____	____	____	____	____	____	____	____	____	____
29	____	____	____	____	____	____	____	____	____	____	____	____
30	____	____	____	____	____	____	____	____	____	____	____	____

CARD 10 - Title 2 - Alternative and Year Title

CARD 11 - Percent Land Developed (PDEV)

Study Area	Hi	Med	Low
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

CARD 11 - Percent Land Developed (PDEV) (cont.)

Study Area	Hi	Med	Low
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

Program 3

Dwelling Yield #A, Grades 1-12 Prediction
Data Collection Forms

CARD 1 - Title Card

School District Name

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

CARD 2 - Control Card

No. of Grades	No. of Years	No. of Dwelling Types	No. of Study Areas	Punched Output	
☐☐	☐☐	☐☐	☐☐	☐☐	☐☐☐☐

CARD 3 - Grade Level Title

☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐ ☐☐☐☐☐☐☐☐

CARD 4 - Dwelling Type Name

Dwelling Type 1
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Dwelling Type 2
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Dwelling Type 3
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Dwelling Type 4
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Dwelling Type 5
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

CARD 5 - Student Yield Values

Grade ___		Grade ___		Grade ___	
MEAN	3 S.E.	MEAN	3 S.E.	MEAN	3 S.E.
. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐
Grade ___		Grade ___		Grade ___	
MEAN	3 S.E.	MEAN	3 S.E.	MEAN	3 S.E.
. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐
Grade ___		Grade ___		Grade ___	
MEAN	3 S.E.	MEAN	3 S.E.	MEAN	3 S.E.
. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐
Grade ___		Grade ___		Grade ___	
MEAN	3 S.E.	MEAN	3 S.E.	MEAN	3 S.E.
. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐	. ☐ ☐ ☐ ☐

CARD 6 - Housing Data*

Predicted Year	Actual Year	Study Area	Dwelling Type 1			Dwelling Type 2		
			High	Med	Low	High	Med	Low
☐☐	☐☐☐☐	☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐

Dwelling Type 3			Dwelling Type 4			Dwelling Type 5		
High	Med	Low	High	Med	Low	High	Med	Low
☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐

*This page should be duplicated for each year of the prediction study.

Program 4

Dwelling Yield B, Grade K Prediction

CARD 1 - Title 1

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

CARD 2 - Control Card

NYEARS	NTYPE	NAREA	IPUNCH
☐☐	☐☐	☐☐	☐☐

CARD 3 - Year Title

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐ ☐☐☐

CARD 4 - Dwelling Title

Dwelling Type 1
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Dwelling Type 2
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Dwelling Type 3
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Dwelling Type 4
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Dwelling Type 5
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

CARD 5 - Yield Values* - Age Group ____

Dwelling Type 1 MEAN .☐☐☐☐ 3 S.E. .☐☐☐☐ Dwelling Type 2 MEAN .☐☐☐☐ 3 S.E. .☐☐☐☐ Dwelling Type 3 MEAN .☐☐☐☐ 3 S.E. .☐☐☐☐

Dwelling Type 4 MEAN .☐☐☐☐ 3 S.E. .☐☐☐☐ Dwelling Type 5 MEAN .☐☐☐☐ 3 S.E. .☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐

☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐

☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐

*Repeat this sheet for each of the six age groups.

CARD 6 - Area Title

CARD 7 - Housing Data

Predicted Year ☐☐

Actual Year ☐☐☐☐

Study Area ☐☐

Dwelling Type 1

High ☐☐☐☐ Med ☐☐☐☐ Low ☐☐☐☐

Dwelling Type 2

High ☐☐☐☐ Med ☐☐☐☐ Low ☐☐☐☐

Dwelling Type 3

High ☐☐☐☐ Med ☐☐☐☐ Low ☐☐☐☐

Dwelling Type 4

High ☐☐☐☐ Med ☐☐☐☐ Low ☐☐☐☐

Dwelling Type 5

High ☐☐☐☐ Med ☐☐☐☐ Low ☐☐☐☐

Program 5

Dwelling Yield #C, Female Population Prediction
Data Collection Forms

CARD 1 - Title Card

School District Name

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

CARD 2 - Control Card

No. of Years	Dwelling Type	Study Areas	Punched Output	Base Year
☐☐	☐☐	☐☐	☐☐	☐☐☐☐

CARD 3 - Dwelling Type Names

Type 1
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Type 2
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Type 3
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Type 4
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Type 5
☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

CARD 4 - Female Yield Values

15-19 YRS.		20-24 YRS.		25-29 YRS.	
MEAN	2 S.E.	MEAN	2 S.E.	MEAN	2 S.E.
.	.	.	.	.	.
30-34 YRS.		35-39 YRS.		40-44 YRS.	
MEAN	2 S.E.	MEAN	2 S.E.	MEAN	2 S.E.
.	.	.	.	.	.

CARD 5 - Housing Base

Dwelling Type 1			Dwelling Type 2		
High	Med	Low	High	Med	Low
☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐

Dwelling Type 3			Dwelling Type 4		
High	Med	Low	High	Med	Low
☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐

Dwelling Type 5		
High	Med	Low
☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐

CARD 6 - Housing Data

Predicted Year	Actual Year	Study Area	Dwelling Type 1			Dwelling Type 2		
			High	Med	Low	High	Med	Low
☐☐	☐☐☐☐	☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐

Dwelling Type 3			Dwelling Type 4			Dwelling Type 5		
High	Med	Low	High	Med	Low	High	Med	Low
☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐

CARD 1 - Title Card

School District Name

CARD 2 - Parameter Card

IYEAR

IGRADE

ISEX

IDATE

IX

FORMAT CARDS

CARD 3

CARD 4

CARD 5

CARD 6

CARD 7

CARD 8

CARD 9

CARD 10

CARD 11

CARD 12

CARD 13

CARD 14

CARD 15

CARD 16 - PI ENROLL

Grade K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐
Grade 9	Grade 10	Grade 11	Grade 12					
☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐					

CARD 17 - P2 BIRTHS

-5 yrs.	-4 yrs.	-3 yrs.	-2 yrs.
☐☐☐☐	☐☐☐☐	☐☐☐☐	☐☐☐☐

CARD 18 - P3 DEATHS

-5 yrs.	-4 yrs.	-3 yrs.	-2 yrs.
☐☐	☐☐	☐☐	☐☐

CARD 19 - VI ABIRTHS

Pred.	15-19 years			20-24 yrs.			25-29 yrs.			30-34 yrs.			35-39 yrs.			40-44 yrs.		
Year	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
-1																		
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

CARD 20 - V2 GIRLS

Pred. Year	15-19 yrs.			20-24 yrs.			25-29 yrs.			30-34 yrs.			35-39 yrs.		
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
-1															
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															

CARD 21 - V3 ADEATH

Pred. Year		H	M	L
-1				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

CARD 22 - V4 APREMI

Pred. Year		H	M	L
-1				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

CARD 23 - V5 AMIGRA

Pred.	Grade 1			Grade 2			Grade 3			Grade 4			Grade 5			Grade 6		
Year	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

CARD 23 - V5 AMIGRA (cont.)

Pred.	Grade 7			Grade 8			Grade 9			Grade 10			Grade 11			Grade 12		
Year	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

CARD 24 - V6 APRIVS

Pred. Year	H	M	L
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

CARD 25 - V7 ATRANS

Pred.	Grade 1			Grade 2			Grade 3			Grade 4			Grade 5			Grade 6		
Year	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

CARD 25 - V7 ATRANS (cont.)

Pred.	Grade 7			Grade 8			Grade 9			Grade 10			Grade 11			Grade 12		
Year	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

CARD 26 - V8 AHOLDS

Pred. Year	Grade 1			Grade 2			Grade 3			Grade 4			Grade 5			Grade 6		
	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

CARD 26 - V8 AHOLDS (cont.)

Pred.	Grade 7			Grade 8			Grade 9			Grade 10			Grade 11			Grade 12		
Year	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

CARD 27 - V9 AINSTI

Pred.	Grade 1			Grade 2			Grade 3			Grade 4			Grade 5			Grade 6		
Year	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

CARD 27 - V9 AINSTI (cont.)

Pred.	Grade 7			Grade 8			Grade 9			Grade 10			Grade 11			Grade 12		
Year	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L	H	M	L
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		